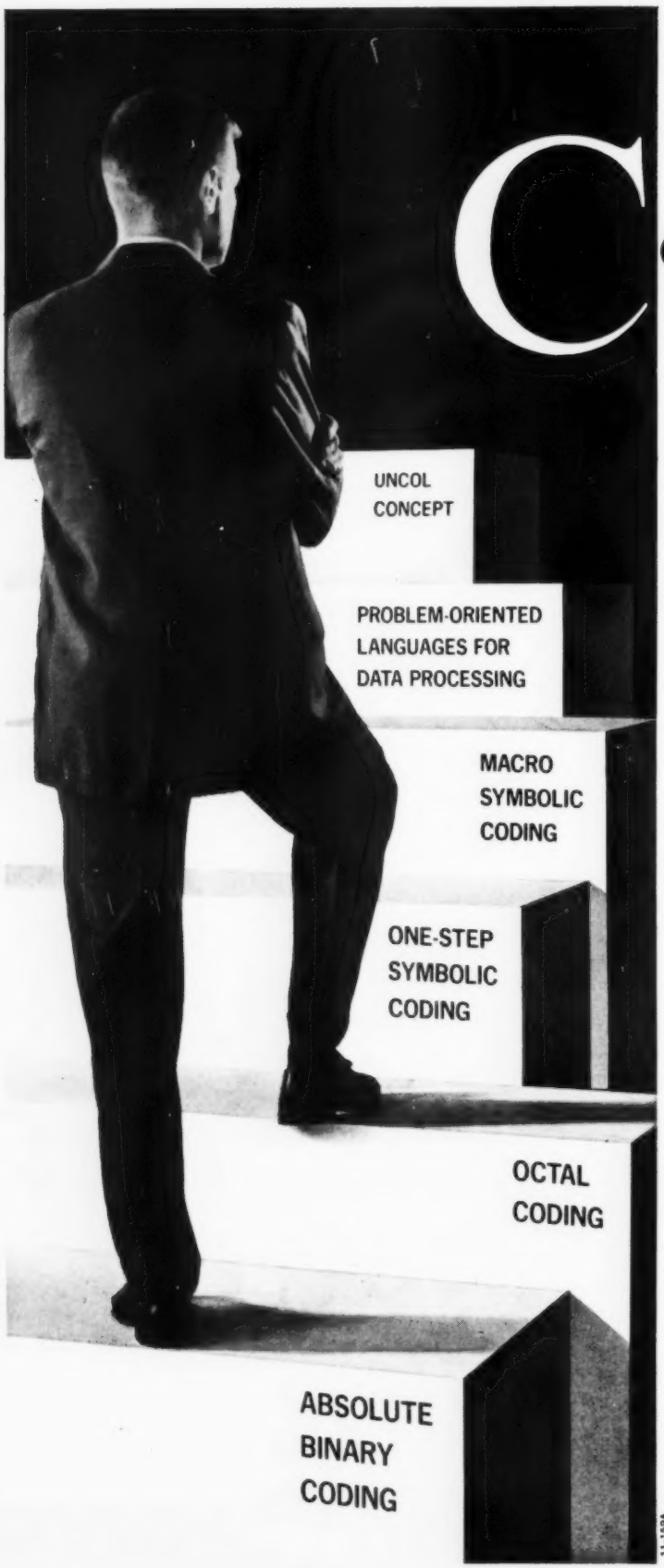
March-1960

DATA PROCESSING

The Magazine of Automatic Office Methods and Management

Editorial Competition page 25

Selecting the Right Equipment page 17



Computer Programmers:

Where do you stand in programming progress?

Are you currently in a position to move upward and forward into newer, more interesting levels of programming? Or is your topmost step still well below the height of the art?

The advanced areas in which we work, e.g. MACRO symbolic coding, problem-oriented language for data processing, and research in Universal Computer Oriented Language only partially indicate the importance of computer programming at SDC.

There is also a basic professional advantage in the fact that programming is a primary function at SDC, rather than a service activity. This unusual situation stems directly from the fundamental nature of our work—developing extremely large computer-centered control systems. Among the many professional values in this strongly computer-oriented environment are the large number of supervisory positions open to programmers, and the fact that most programming supervisors have programming backgrounds.

Positions now open at all levels (at Santa Monica, California and Lodi, New Jersey).

The extension of SDC's programming activities into new areas of large computer-centered control system development has created openings for Programmers at several levels of experience, including senior status. Please send your inquiry to D. B. Price, SDC, 2447 Colorado Avenue, Santa Monica, California.

"SP-127 ANCHOR An Algorithm for Analysis of Algebraic and Logical Expressions," a paper by Howard Manelowitz of SDC's staff is available upon request. Send request to Mr. Price at SDC.

SDC

SYSTEM DEVELOPMENT CORPORATION

Santa Monica, California • Lodi, New Jersey

Circle No. 1 on Reader Service Card

FIRST CLASS
PERMIT NO. 13600
DETROIT, MICH.

BUSINESS REPLY CARD
No postage stamp necessary if mailed in the United States

Postage will be paid by—

GILLE ASSOCIATES, INC.
956 MACCABEES BLDG.
DETROIT 2, MICHIGAN

For subscriptions to

DATA PROCESSING

Please enter the following subscription:

☐ One Year (12 issues) $7.50 ☐ Two Years (24 issues) $13.50

NAME _____ TITLE _____
Please Print

COMPANY _____

ADDRESS _____

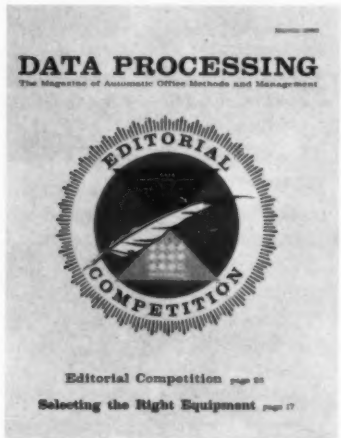
CITY _____ ZONE _____ STATE _____

☐ Payment Enclosed.
☐ Send Bill.

☐ New Subscription.
☐ Renewal

DATA PROCESSING

Volume Two • Number Three



Publisher, FRANK H. GILLE

Editor, EUGENE F. MURPHY

Managing Editor, MORTIMER J. SULLIVAN
Associate Editor, JAMES W. O'CONNOR
Contributing Editors: JOSEPH R. DE PARIS
RAYMOND DREYFACK, RAY MARIEN

Assistant to the Publisher, ROSEMARY A. DORR
Art and Production Director, DOUGLAS E. HOLDAWAY
Circulation Director, PATRICIA A. DEC

▽ ▽ ▽

Published monthly by
GILLE ASSOCIATES, INC.
956 Maccabees Building
Detroit 2, Michigan
TEmple 3-3454

EDITORIAL OFFICES
270 Madison Avenue
New York 16, New York
LExington 2-2990

ADVERTISING OFFICES

MAIN OFFICE
956 Maccabees Bldg.
Detroit 2, Mich.
TEmple 3-3454

270 Madison Ave.
New York 16, N. Y.
LExington 2-2990

1417 Georgia St.
Los Angeles 15, Calif.
RIchmond 7-6561

420 Market St.
San Francisco 11, Calif.
DOuglas 2-3899

Subscription rate $7.50 per year, United States and possessions and Canada; other countries $8.50 per year. Single copy 75c when available.

Send subscription correspondence and change of address to Gille Associates, Inc., 956 Maccabees Building, Detroit 2, Mich. Subscribers should notify publisher promptly of any change of address, giving old and new addresses, including city postal delivery zone. If possible, enclose address label from recent issue of magazine. Allow six weeks for change to become effective.

©1960 Gille Associates, Inc. All rights reserved.

Also publishers of The Punched Card DATA PROCESSING Annual (Applications Volumes and Reference Guide) and Data Processing Handbooks.

OBSERVATIONS . . .

from the publisher . . .

"BUT I AM NOT A WRITER," you say. "How can I participate in an editorial competition?"

The data processing editorial competition which we are currently sponsoring is not meant for writers. It is meant for people like yourself who are engaged in business or institutional operations using data processing equipment. Its purpose is to draw out *ideas*. Our staff of capable editors will take care of whatever writing deficiencies are necessary prior to publication.

We have long been aware of the fact that many of the best data processing ideas, solutions and applications have never been exposed because the originator was reticent to submit them for public inspection, due partly to a lack of writing ability and partly because they have never been adequately motivated to do so.

Actually there are two important reasons why you should participate in this editorial competition. First, as already mentioned, to make your ideas available to others in the field who stand to benefit from your experience. You will in turn benefit from their experience. Secondly, this competition is intended to encourage you to write your procedures for use in your own organization. In a recently published article, John B. McMaster stated five main reasons for having complete up to date *written* procedures. Summarized, these are:

1. The very act of writing causes you to re-examine each step in your methods. This in itself usually results in improvement.

2. Morale and production among workers are improved when everyone can refer to a documented procedure.

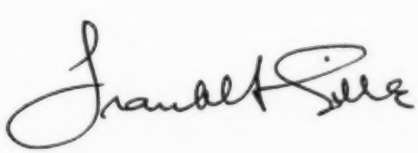
3. Written procedures save the supervisor the time necessary to make frequent explanations.

4. Employee orientation and training time is greatly reduced.

5. Employee replacement is more easily accomplished.

So you see you can't possibly lose. You stand to gain personally in many respects, and you will be making a worthwhile contribution to others in the data processing field.

Details on the competition are explained elsewhere in this issue.



CONTENTS

Special Feature

▶ AN EVALUATION OF EQUIPMENT FOR EXPANSION OF DATA PROCESSING FACILITIES
by United States Army Signal Supply Agency 17

Once the potentials of a computer are realized and achieved, whole new work areas become practical *to computerize. In so doing the original system becomes burdened. What to do? The solution of the U. S. Army Signal Supply Agency is one of the best. The method applies to* any *streamlining or overhauling operation in* any *office.*

Special Announcement

▶ EDITORIAL COMPETITION 25

Features

▶ THE STATE-OF-THE-ART IN ADMINISTRATION by Leslie Matthies 13

Administration advances are lagging behind technological achievements. An internationally respected systems man outlines the current state of systems affairs, explains why this is so, and then what must be done to attain order and balance.

▶ "NAME CODE" by B. W. Taunton 23

This is an outstanding example of management by exception. The system and program are so refined that the computer itself points out the exception for action by management.

Application of the Month

▶ BILLING WITH PUNCHED CARD METHODS by William K. Donald 33

A hardware wholesaler, with 15,000 individual billings each month, uses a Card-O-Matic/Univac 60 system to process a million and a half lines of billing each year.

Monthly Features

▶ *Joseph R. DeParis on EQUIPMENT*
A NEW SYSTEM 36

▶ *Ray Marien on FORMS*
THE BIGGER THEY COME — THE BETTER WE LIKE IT 43

▶ *Raymond Dreyfack on PERSONNEL*
WHERE DO YOU GO FROM HERE, JOE? 9

Departments

▶ BOOK SHELF 50
▶ CALENDAR OF COMING EVENTS 21
▶ COMMENTS FROM READERS 6
▶ DATA . . . YOURS FOR THE ASKING 48
▶ EDITORIAL 52
▶ I'VE GOT A PROBLEM 47
▶ NEWS SUMMARY 32
▶ OBSERVATIONS 1
▶ OUTPUTS 46
▶ PEOPLE AND PLACES 44
▶ PRODUCTS AND SERVICES 38

AUTHORS

LESLIE MATTHIES *("The State-of-the-Art in Administration")*, director of the Foundation For Administrative Research of Tulsa, Oklahoma, is the Editor of the systems newsletter SYSTEMATION. He developed such systems techniques as the Playscript Procedure, The Self-Instructing Form, Springboards to Action, Selection of the Systems Cycle, The Seven Ear-Marks of an Effective Report, and the Work Inventory. Mr. Matthies received the 1958 SYSTEMS MAN OF THE YEAR AWARD, the Systems and Procedures Association of America's highest award. He was General Chairman of the 1957 International Systems Meeting held on the Pacific Coast for the first time and was National Director of the Systems and Procedures Association of America in 1956, 1957 and 1958. Mr. Matthies has also served as seminar leader for the American Management Association and for the Systems and Procedures Association.

B. W. TAUNTON *("Name Code")*, Assistant Comptroller of The First National Bank of Boston, Massachusetts, is in charge of the Electronic Programming Department of the Bank, which has the responsibility of planning for and installing the Datamatic 1000, a large-scale general purpose computer, as well as research in the field of electronics. He attended Boston University, The American Institute of Banking, The Massachusetts Institute of Technology (digital computers), IBM Customer Administration School (702, 650, and 705), and Remington Rand's Univac Programming classes. He is the author of the textbook, "Electronic Data Processing for Business," and numerous articles and papers which have appeared in various technical magazines and periodicals.

SPECIAL NOTICE

THE APRIL AND MAY ISSUES of DATA PROCESSING will be combined into one issue (scheduled for April 25). This combination issue will make it possible to present a comprehensive report entitled, THE SCOPE OF DATA PROCESSING. This special report will include in condensed form latest information on many important phases of data processing . . .

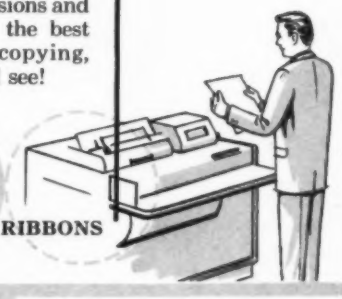
- **New Computer Concepts**
- **New Input Developments**
- **Management Controls**
- **A New Look at Paper Tape**
- **Data Communications**
- **Personnel**
- **Coding**
- **Magnetic Ink Character Recognition**
- **Operations Research**

and others, plus the special feature **"WOMEN IN DATA PROCESSING."**

Circle No. 2 on Reader Service Card.

"Codo-MATION" begins here!

"Codo-mation" is the art of selecting the correct ribbons for Data Processing Machines. When it comes to Tabulating equipment, no other ribbons surpass Codo's made with Perma-Jet ink. They not only give sharp, clear impressions and long life, but are the best for Thermo-Fax copying, too. Try some, and see!



Tabulon RIBBONS

Codo-
MANUFACTURING CORPORATION
Leetsdale, Pa.

Please send us a sample Tabulon Ribbon
NAME.....
ADDRESS.....
CITY.....STATE.....
PC

BEEMAK TAB CARD HOLDERS

BP-100 CARD HOLDER

Can be attached to products, conveyor belts, bins, boxes, shelving, to implement production control, inventory control, invoicing and other punched card systems. Beemak Holders have withstood hard usage for eight years and are made in ivory, red, green, blue, yellow and black for color coding if desirable. Keeping correct tab cards at the source of record data provides better controls and faster handling of all types of merchandise.

BP-130 MAGNET HOLDER

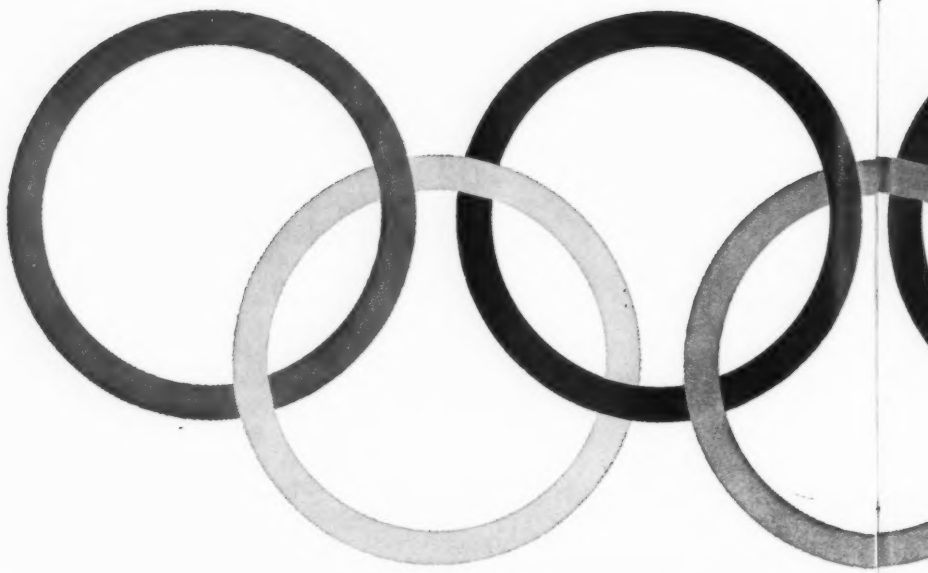
Card holder with four heavy permanent magnets can be attached or hung on any metal surface such as tab machine, filing cabinet or metal desks. Provides finger-tip accessibility to operators, reduces wasted time and chances of error.

1 to 24 $1.50 each; 25 to 49 $1.35 each; 50 or more $1.25 each. Available for immediate delivery from

BEEMAK PLASTICS
7424 SANTA MONICA BLVD., LOS ANGELES 46, CALIF.

Circle No. 3 on Reader Service Card.

IBM RAMAC® 305 SCORED THE WINTER OLYMPICS



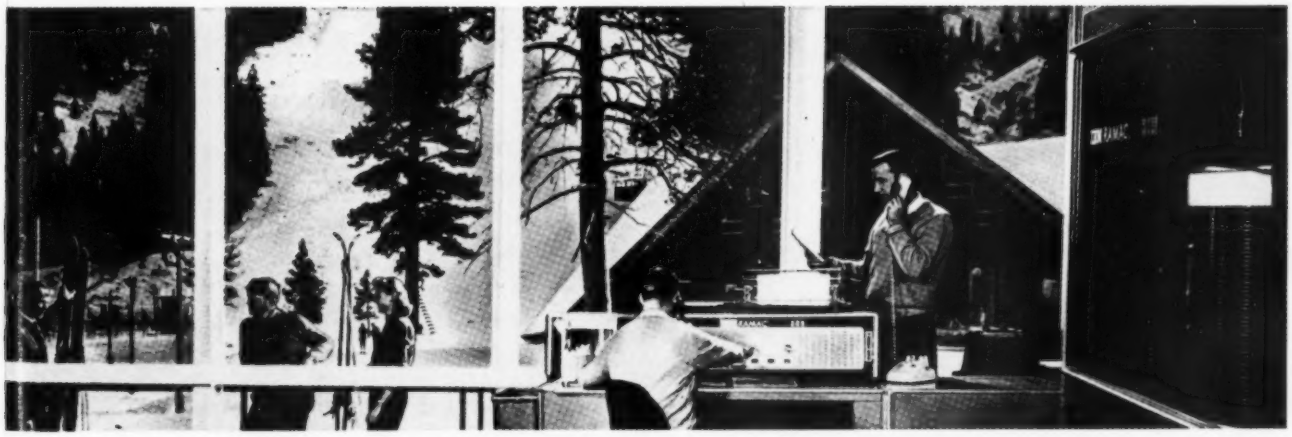
More than 3 million visitors saw the IBM RAMAC 305 *in action at Moscow and Brussels.*

Squaw Valley, California: At the Winter Olympics in February, this IBM Data Processing System gave results of each event almost before the last contestant could catch his breath. Minutes after an event was completed, results were flashed to the judges and information centers.

The key to the speed and versatility of this system is RAMAC's exclusive random access capability. This capability makes it possible to process information in the order received while, at the same time, updating all related records on file.

Throughout the world RAMAC is helping to solve the problems of business with speed and economy. Whether purchased or leased, RAMAC can be profitable to your business, too.

VIII Olympic Winter Games
Commemorative Medal



As each competitor finished his event, word was flashed directly to RAMAC. Here, where almost a million words of Olympic data (in both English and French) were stored on the disk file, RAMAC consulted the rules, computed the scores and printed out a new list of standings as affected by the latest contestant's results. After the event was completed, RAMAC punched out a paper tape for wire services communication. Final results were printed on duplicating masters for prompt press release preparation.

balanced data processing **IBM**®

Circle No. 4 on Reader Service Card.

Comments from Readers

U.S.E.—Univac Scientific Exchange

New York, N. Y.

In the interests of accuracy, we would like to comment on the title of the article which appeared on page 43 [*People and Places*] of the November/December 1959 issue concerning the Univac Users Conference. The article was titled "U.S.E." and these latter characters refer to Univac Scientific Exchange, which is an organization made up of users of Univac Scientific 1103A and 1105 Computing Systems. USE meets quarterly at one of the installation sites to discuss problems common to all users of Univac Scientific computers. The next USE meeting is scheduled for March 15 in San Francisco.

The organization you were referring to in your article is composed of users of Univac I and II Commercial Data Processing Systems and bears no relation to USE other than the equipment manufacturer.

V. Erskine
Univac Scientific Sales
Remington Rand Univac

WHAT DO THEY HAVE IN COMMON?
COLGATE-PALMOLIVE COMPANY
DUQUESNE BREWING COMPANY
THE ESTERBROOK PEN COMPANY
FEDERAL ELECTRIC CORPORATION
FIRST TRENTON NATIONAL BANK
LIBERTY NATIONAL LIFE INSURANCE COMPANY
MINNEAPOLIS-HONEYWELL REGULATOR COMPANY
CHAS. PFIZER & COMPANY
STEPHEN F. WHITMAN & SONS
OLIN-MATHIESON CHEMICAL CORPORATION
THE ORIGINAL AND ONLY WORKABLE CONTINUOUS TAB CARD WITH MAXIMUM EFFICIENCY

FORMSCARD

Two years ago, we introduced FORMSCARDS, the only continuous tab card with no medial waste strips between cards. Since that time, the companies listed above and hundreds of others among the best known business and industrial firms in the world have become enthusiastic FORMSCARDS users. Here's why:

no medial waste strips between cards
pre-punched as required
tabulate at any speed
separate manually or on any burster
vouchers of any length; side, top or bottom
can be part of a multiple forms set

call, wire or write:

Forms inc

manufacturers of line-hole continuous business forms

WILLOW GROVE, PA. • PHONE: OLdfield 9-4000
Sales representatives in principal cities

Circle No. 5 on Reader Service Card.

Forms Manual

409 E. Broward Blvd.
Fort Lauderdale, Fla.

Under "I've Got a Problem" in your January issue, page 32, one of your readers commented that help was needed on systems work, and that forms companies should publish manuals on forms improvement.

For your information, the NBFA has published the NBFA Manual and Reference Guide. The work is loose-leaf, is now over 500 pages, 12 sectional divisions.

The Manual has been designed to provide a better understanding of the methods and techniques involved in business forms; for general information and reference, and training of salesmen. [It] is kept current.

F. J. Ring
Secretary-Treasurer
National Business Forms Associates

Accounting Emphasis

Hartford, Conn.

. . . My congratulations to your organization for publishing a journal that caters to the accounting rather than the scientific elements of the Data Processing society.

G. M. Perry
Planning Assistant
Data Processing Department
The Travelers

E-13B Type Font and Ribbons for Magnetic Ink Printing

13a Schwabach
Hindenburgstr. 60
Bei Nurnberg, Germany

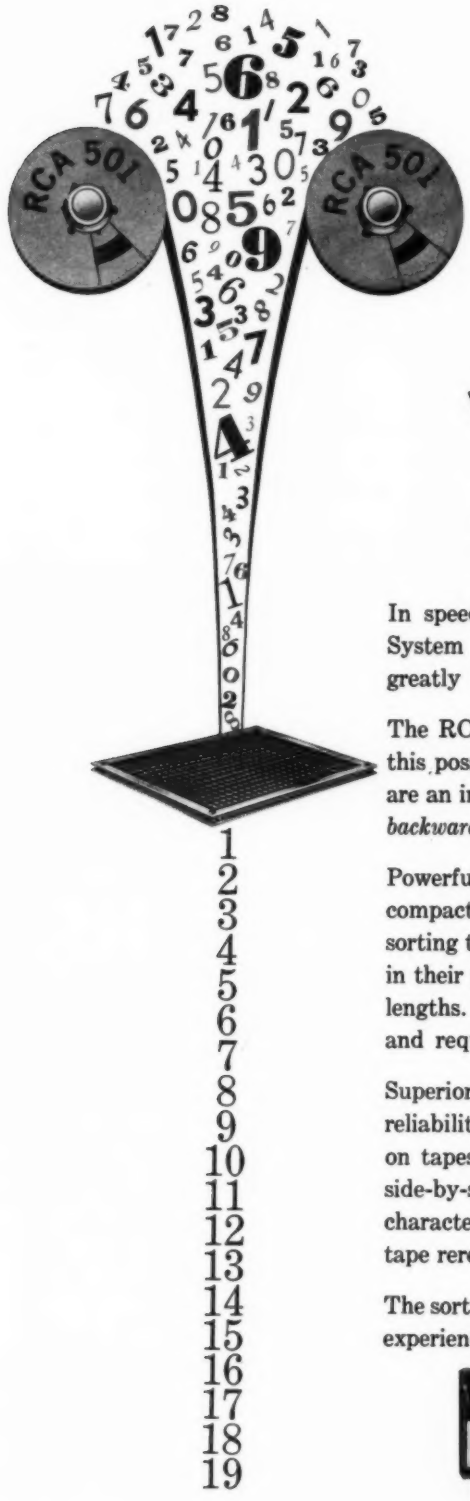
As a subscriber and reader of DATA PROCESSING, I am writing to you since . . . you may help me in one or the other respect . . .

I am looking for a manufacturer of steel type of the E-13B sort for magnetic ink printing . . .

Another question relates to ribbons for magnetic ink printing. Perhaps you know manufacturers who can already deliver such ribbons . . .

Michael Maul
Civil Engineer

If anyone has information to send Mr. Maul, in addition to that which we were able to send him, he would welcome it. ■



Another way RCA serves business through electronics

Solve sorting bottlenecks with an RCA 501

Up to 40% of your data processing dollar can be consumed in sorting. Now, RCA offers a major breakthrough in sorting economy!

In speed, efficiency and low cost per item sorted, the RCA 501 System is indeed impressive! Tape limited sorting operations are greatly accelerated by the unique combination of 501 features.

The RCA 501 can *read and write simultaneously* on tape. To make this possible, *dual buffers*—a pair for input and a pair for output—are an integral feature of the system. Furthermore, the 501 can *read backward* avoiding time lost in rewinding.

Powerful features built into the tape system result in extremely compact information recording (saving miles of tape and hours of sorting time). *True Variable Length Recording* reads and writes items in their natural length rather than in artificial fixed word and block lengths. 501 Tape Units use an exceptionally short gap between items and require only 3.5 milliseconds to achieve full operating speed.

Superior sorting capabilities in the 501 are backed up by important reliability features. Positive accuracy is afforded by *Dual Recording* on tapes. All information is recorded in duplicate and both of the side-by-side recordings have individual parity checks. If either character is faulty, the correct one is automatically used without tape reread.

The sorting performance of the RCA 501 System is a fact of operating experience—not theory or conjecture. For full information write to—

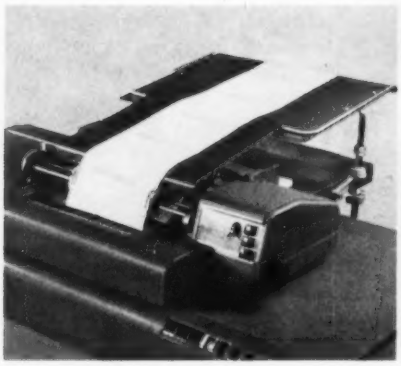
RADIO CORPORATION of AMERICA
Electronic Data Processing Division
CAMDEN 2, NEW JERSEY

Circle No. 6 on Reader Service Card.

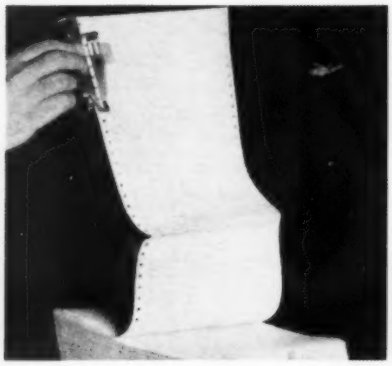
NEW

Moore Speediflex

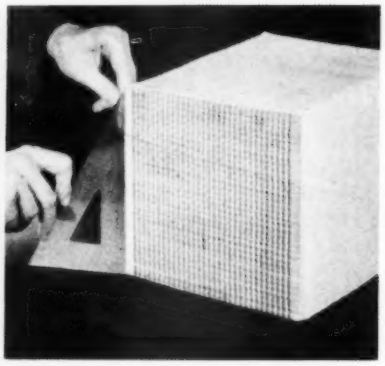
GIVES YOU THESE THREE FORMS-HANDLING BENEFITS



1 PERFECT FEEDING—The entire set of parts and carbon feeds, naturally and in perfect alignment, around the writing platen.



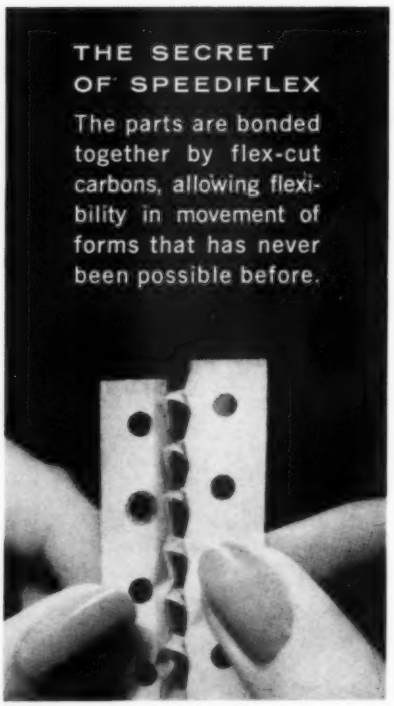
2 PERFECT REGISTER, because there's no tenting or peaking, and both sides flow freely in natural, flexible movement.



3 PERFECT REFOLDING in neater square packs results from still another advantage—Moore's unique way of perforating the sets.

This Moore 'first'—a brand new concept—results in new forms-handling efficiency for users of continuous marginal punched forms. The revolutionary new dimension is the flex-cut carbon. It acts as a flexible bond between the various parts, and allows the Speediflex unit to flow naturally without 'tenting' or 'peaking,' aligning at the point of writing for perfect part-to-part register. This great new form introduces many other forms-handling benefits. For a demonstration, look up the Moore man in the telephone directory or write the nearest Moore office.

Speediflex is a patented product of Moore Business Forms, Inc.


THE SECRET
OF SPEEDIFLEX
The parts are bonded together by flex-cut carbons, allowing flexibility in movement of forms that has never been possible before.

MOORE BUSINESS FORMS, INC., Niagara Falls, N. Y.; Denton, Texas; Emeryville, Calif. *Over 300 offices and factories throughout the United States, Canada, Mexico, Cuba, Caribbean and Central America.*

MOORE®

Circle No. 7 on Reader Service Card.

Build control with

MOORE BUSINESS FORMS

RAYMOND DREYFACK

—A Monthly Feature **Dreyfack on PERSONNEL**

Where Do You Go From Here, Joe?

LET'S CREATE A CAPSULE BIOGRAPHY. Joe Collins, age 35; occupation, Data Processing Department Manager; income, $7,500 per year. Except for three years in the service, Joe has spent most of his working life, first as a machine operator, more recently as a punched card department supervisor. He's married, has two kids, and the part of a late model car that doesn't belong to the local bank. Ditto a small house—a small house with a large mortgage.

It's Friday afternoon, twenty past five. Except for a few hours tomorrow, Joe's work for the week is done. At this moment he's permitting himself the luxury of a few minutes of reflection. It's something he's earned.

I'm 35 years old, Joe thinks to himself. I know my job well. Hand me a control panel and I'll wire up a storm. My department runs smoothly and efficiently, and some of the reports even get out on schedule. But, where do I go from here?

Good question. Any of three options, Joe, and it's the dealer's choice. You've been with your firm eight years. During that time you've gathered certain advantages—stock-sharing plan, vacation, pension, etc. You can, of course, continue to maintain your status quo. Keep on running the installation pretty much as is. This would be the easiest course to follow, take the least amount of effort. That's your first choice, Joe.

Here's another. Let's make an objective evaluation of your employer. How do you stand in the political hierarchy? What's your firm's policy on advancement from within? Are you well-liked? Is your firm expanding, declining, standing still? In short, if you knocked yourself out to enlarge your knowledge and abilities, would there be any place here to put them to use? If your reaction to these questions is negative it's time to start nosing around in the greener pasture department. That's your second choice on a silver platter —or, maybe tin.

But don't leave yet, Joe. Here's one more for the road. There's still a third choice, and maybe this is the best one yet if the shoe fits. In arriving at choice number two, if you'll recall, the general reaction to our vital questions about your firm was negative, so we were forced into a branching routine. Well, let's go back now to Step 63 of our program and assume that the reaction was positive. Swell firm to work for, you've always been treated well, and Mr. Lightfeather, who's now the Chairman of the Board, was once a clerk in the mail room, so there's hope for you too.

So our reaction is a hearty yes, and our branching routine gets eliminated. We stay where we are and continue with our program. But let's not forget the small house with the large mortgage. And let's not forget about Mr. Lightfeather.

Choice number three then? Where do we go from here? Well, we start out in the same way as for choice number two. We learn more about new equipment, bone up on tape applications, computer studies. We read through our trade publications, take a few courses. We broaden our scope. Then we ask some questions.

Ankle bone's connected to the shin bone's connected to the knee bone. What's the tab bone connected to? The systems bone? The sales bone? The controller's bone? In time, why not?

What do you like to do, Joe? What do you do best? If your leaning is towards systems there's much to be accomplished in this direction. If you like sales—well, you've been preparing sales reports for a long time. You know the company's products from the inside out. You're fairly presentable, and have a nice personality. You've knocked yourself weary on occasion on special runs for the sales director, and he thinks you're a pretty nice guy. So, why not?

So you know what you want, where you'd like to go. All you need now is to follow a simple two point program. Point one: preparation. Know-how, know-how, and more know-how. For this there is no substitute nohow.

Point number two. Are you ready to spring off the diving board? Or are you *(in your own estimation, at least)* Great Big Indispensable Man in the installation? Without you present the show folds? If such is the unfortunate case you've accomplished two main objectives. One, you've created yourself a rough situation. If you want to attend that seminar, or if you happen to be out sick, or if you fall down and break a leg *(which can happen to the best of us)* — you've had it. And two, you've succeeded admirably in fouling the career of one Joseph J. Collins. *(The middle J's for you-know-what.)*

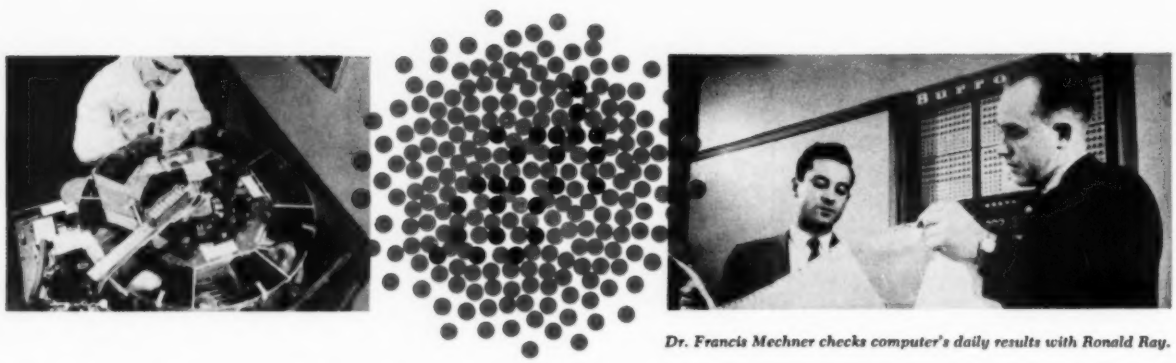
Because, unless there is somebody all ready, willing, eager—*and trained* —to step into your shoes, Pal Joey, you're stuck to the ground yourself.

So that's your third choice, Joe. Evaluate your own company. Find out where you want to go, and determine as honestly and objectively as you can if it's possible to get there. Then all you have to do is —

Ooops. There goes the bell. Five-thirty, and—T.G.I.F.—now you can take off. But I hope we've given you something to think about. ■

A Statement from Francis C. Brown, Chairman of the Board and President, Schering Corporation:

"In behavioral research alone, our Burroughs computer has multiplied our productivity by 100 times!"



Dr. Francis Mechner checks computer's daily results with Ronald Ray.

"We, at Schering Corporation, have grown accustomed to miraculous developments in our industry. So many advancements have been made in pharmaceutical research in the last two decades, we are convinced that we may indeed be on the brink of a pharmacological revolution.

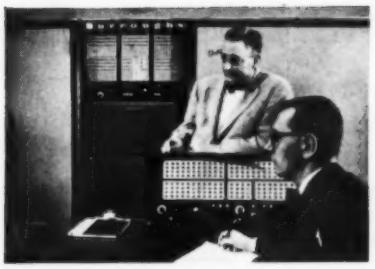
"Yet, there is so much more to be done, so many new avenues to explore, that we recognize the only real source of continued development is through expanded research efforts. Through research, Schering has already created several of the world's leading ethical drugs... major emphasis has been on cortical hormones and antahistamines. Some, like Coricidin, have become household words.

"While the results of research are sometimes dramatic, there is little of the miraculous in the day-to-day explorations made by pharmaceutical scientists. For one thing, pharmaceutical research is expensive... costs are over three times more per sales dollar than all other industries and rising substantially each year. Findings are often inconclusive and only a small portion ever reach fruition in a marketable product. And with a diversified line of products such as ours, we must maintain research projects in many different areas simultaneously. Even with the newest and most successful discovery, a competitor may enter the market with a better product that puts yesterday's 'miracle' out of favor.

"Yet, a relentless search for new products is a necessity. It is the only reasonable assurance of the continuing health of our own business enterprise. Today we are conducting extensive experimentation with chemical molecules of known pharmacological properties. The object is to achieve radically new pharmacological results by means of various alterations in chemical structure. Once achieved, these new compounds must be evaluated in laboratory animals. The methodology of this program is exemplified by an experiment carried out in Schering's Behavorial Research Laboratory. Here, eight highly trained rats take their turn in succession night and day, at a testing station where their behavior is recorded and then analyzed by computer. This is the type of experimentation in which the behavorial effects of drugs are tested in animals. The results of these experiments permit predictions concerning the effects these drugs will have on man.

"With thirteen experiments of this type proceeding on a continuous basis, the volume of data generated could never be handled without the aid of a computer. The Burroughs 205 performs computations every day which the staff

PHOTOGRAPHS BY J. ALEX LANGLEY



Dr. Bradley Whitman, Director of Research Services, confers with Gordon B. Thomas, Biometrics Manager.

of Schering's Behavorial Laboratory would require years to complete. The computer's final output is in the form of tables and graphs which are then studied and interpreted by psychopharmacologists.

"The decision to install a Burroughs 205 computer was upheld by a need to provide rapid, complete and economic analysis of the data which is produced by the research division at great cost. We investigated the computer field thoroughly, and after careful study and professional consultation, our technical people believed no other computer met our requirements so well. One of our scientific programmers, Biometrics Manager Gordon B. Thomas, was particularly impressed with the 205's ability to handle large masses of data with the power of a large scale computer... and at less than half the cost. Mr. Thomas felt the 4000-word memory of the 205 greatly facilitated the execution of research programs, many of which exceed 10,000 steps.

"In our research projects alone, the 205 has earned its keep. Dr. Bradley Whitman, head of Research Services, reports our 205 computer is turning out fast, accurate results at a cost we could never have realized by any other method. Research scientists are freed from time-consuming data collecting and may now spend more time on creative work.

"In addition to serving as a research aid, our 205 has provided us with other benefits as well.

"Our Procedures Department Manager, William B. Spencer, points out that the 205 is completely compatible with our commercial needs as well as research. In fact, our recent purchase of additional Burroughs peripheral equipment will allow us much greater capacity for commercial applications.

"As we expand and broaden our search for new products, we expect commensurate growth in other areas of our company as well, and we are confident that our 205 computer, with its modular expansion features, will keep pace with our computing needs."

FRANCIS C. BROWN
Chairman of the Board and President
Schering Corporation

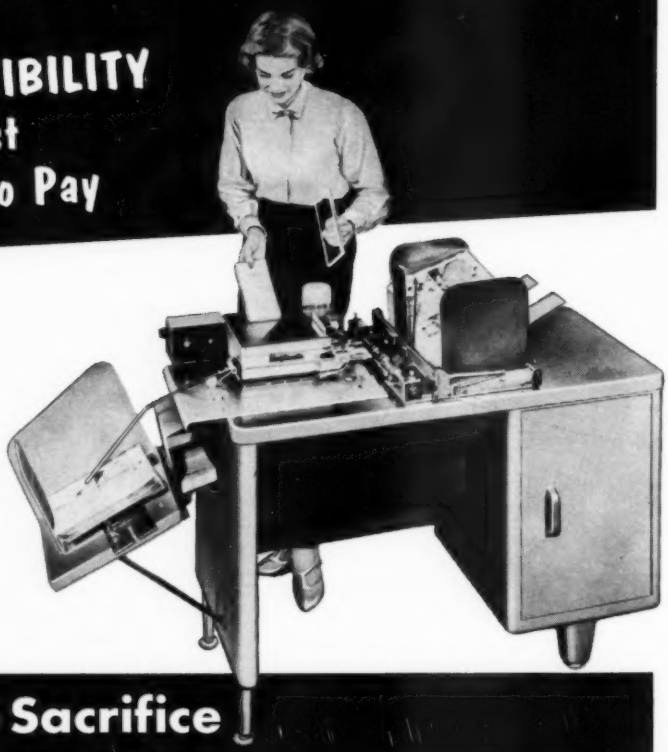
Hundreds of other scientific and commercial users of Burroughs computers are confirming the same experience. Burroughs complete line of electronic data processing equipment is backed by a coast-to-coast team of computer specialists, all eager to tell you how Burroughs can help in your business. For additional information, write ElectroData Division, Pasadena, California.

Circle No. 8 on Reader Service Card.

Burroughs Corporation

"NEW DIMENSIONS/in electronics and data processing systems"

LIST SELECTION . . . and ADDRESSING FLEXIBILITY At a Fraction of the Cost You'd Expect to Pay



SCRIPTOMATIC MODEL 10-S ADDRESSING MACHINE

Designed to bring automatic list handling and addressing selectivity within reach of every mailing list user. Dependable electronic sensing feature permits the Scriptomatic Model 10-S to selectively address and count simultaneously without disturbing file sequence. This is a big order for moderately priced addressing equipment, but you get all this and more in the Scriptomatic Model 10-S!

BIG Savings...at No Sacrifice in the Jobs You Want to Do !

The Scriptomatic Addressing and Data Writing System represents the "perfect marriage" of punched card records and addressing equipment. The Model 10-S simply reads the notched edges of any card and prints from it or skips it according to program. Masters are made easily by any typist and electric typewriter in a fraction of the time required to make stencils or plates. Dollar savings are as drastic as the cost of paper versus metal, with extra bonuses in lower labor requirements and up to 75% less filing space.

Some Scriptomatic users have saved enough to pay for the system installation in the first year. Naturally, they are "heroes" in their companies and you can be, too! Write today to Scriptomatic, Inc., 1109 Vine Street, Philadelphia 7, Pa., for detailed literature and the name of your nearest Scriptomatic representative. Chances are, we have some specific Scriptomatic case histories in your field.

WHAT IS SCRIPTOMATIC?

A refinement of the chemical transfer process, by which the data to be reproduced is imprinted on the reverse side of the card master as it is being typed. Precise fluid and pressure controls on Scriptomatic Addressing Machines insure high quality legibility and long life for the masters; up to 200 or more impressions, the equivalent of many years of normal list usage. Masters become an integral part of any card filing system and fit right in with any card handling equipment.

Circle No. 9 on Reader Service Card.

Scriptomatic

Modern Addressing—Data Writing Machines and Methods

OTHER BASIC SCRIPTOMATIC EQUIPMENT

Model 101—Larger, more completely automatic. Full punch card field reading

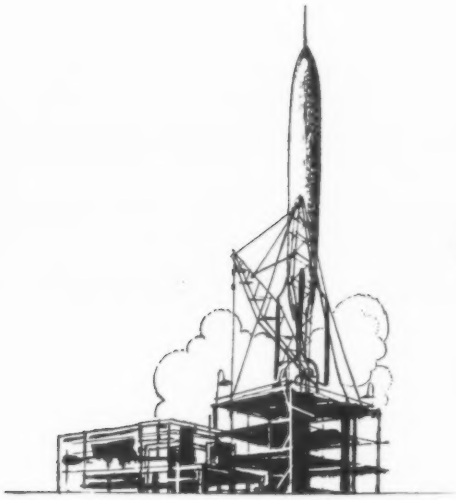
Model 301—High Speed Tape Lister. Full punch card field reading

Model 4—Hand Addresser

Scriptomatic Master Card Writer

Scriptomatic Filing Equipment

S1000



The State-of-the-Art in Administration

The science of administrative systems has developed without any art. The possibilities of the tools are fantastic but their use borders on wastefulness.

By Leslie Matthies

AT CAPE CANAVERAL in Florida, one of our missile engineers said, *"In our work we have two major problems to overcome in launching missiles and in developing our missile program. One is* **gravity.** *The other is* **paperwork.** *I am convinced that scientists will be able to solve the problem of gravity, but I wonder whether we can solve the paperwork problems."*

There are indications that our rapid technological advance, coupled with our stone-age administrative practices, have brought us to the dangerous unbalance! The paperwork problem is a major handicap that the technical man must overcome. It is symbolic of an almost utter failure to make advances in administrative effectiveness worthy of mention.

Technology Has Progressed

We have made unbelievable progress in the area of things—in activities using mathematics, materials, engineering, and science. We have developed submarines that have crossed under the Polar Ice Cap.

We are building a solar power plant for use on the moon. This plant converts sunlight into electricity. It will supply power for our space men once we get them on the moon.

In the last fifty years there have been more technological advancements than in the previous 4,000 years. Developments are coming so thick and fast that technical men can hardly keep abreast of them.

One of the things that has contributed to this material advancement has been the *sharing* of *know-how*. The alert electronics engineer who specializes in magnetics knows reasonably well the boundaries of today's knowledge on magnetics.

The pace of technological progress isn't slowing down—it's accelerating. In 1959 the United States alone will spend over 10 billion dollars for technological research. Compare that tremendous sum with what is spent to improve administrative effectiveness.

A large company used micro-wave transmission to secure data from its field offices and feed it into headquarters. Here automatic key-punching machines, working from the micro-wave impulses, punched cards. From this point on the company was forced to ignore its computer and go to hand-methods to get the field data to the executives on time to do any good.

The Situation in Today's Field of Administration

But we have not shared. *Where* can you get information to help you solve a specific administra-

tive problem? The machinery for the exchange of administrative know-how is creaky. It is relatively ineffective. Because of this, you must spend months in survey work to solve a problem that is nearly identical to dozens of problems already solved by other men. You can only look at the situation as you find it. Then you must devise your answers to your own problems. If a springboard solution from some other fellow's experience is found, it is only by stumbling across it.

The Unknown State-of-the-Art

There is no doubt that there *is* a basic solution to every problem in administration that could ever arise.

The solution *exists*. It *has been* thought out. It has been successfully *applied!* But where? Where is the foundation fund of knowledge—from which specific problems can be solved? All solutions to administrative problems can be called the art of administration. But no one knows exactly what it is. Consequently we race over the same ground in the field of administration.

You have an inventory problem, and you solve it. I have an inventory problem and I solve it. Each time we start from scratch. There is no established postulate, no common denominator.

Is there a way to extract the principles that were used to solve the inventory problem, so that the next man can apply them without more research?

There is no sharing because the machinery to accomplish it is practically non-existent. It can't be proven that administration generally is good, or bad. We can only go on our personal opportunities to sample.

After more than twenty years of staff work, my sampling makes me believe that administrators today are making the same mistakes that other men made twenty years ago.

Take a current sample of how the same ground is covered a thousand times. Consider the feasibility study—that administrative May Dance that uses up eight or ten man-years of time and four or five pads of expense account blanks. Objective: to prepare a recommendation on the purchase of a computer.

How many feasibility studies have been made? 500? 1000? 2000? 5000? How much feasibility knowledge has been shared? And after the computer is installed, are other eager-beavers warned about errors in underestimating the formidable problems encountered?

Complacency Can Be Dangerous!

We've assumed that administration as a whole is quite good—that vice-presidents, managers, directors, supervisors, staff men, and office people are doing a fine job. My own observations lead me to believe that administration is not nearly as good as we think it is. If you think your management is really good—is an exception—then be honest about your answers to the following questions:

- Do they make good use of systems techniques?
- Are their policies defined?
- Are these policies made available to everyone who can use them?
- Have they spelled out the goals of the organization, and the goals of the sub-units?
- Have those statements been given to each employee?
- Does management *really* plan ahead?
- Did they meet the last recession by pulling plans out of the drawer and putting them into effect?
- Does management develop people to take over in management jobs in the years *directly* ahead?
- Does it have any method of measuring a manager's effectiveness?
- Does it measure, and use the measurements, of the work output of *large segments* of your organization?
- Does management take the time to analyze problems and to come up with solutions?
- Has the organization really developed specific systems plans to do work . . . work that will go in the exact direction of the defined goals?
- Do executives get systems reports that really help control action?

Speed hasn't done anything for printing reports. They are nothing but a long string of figures. The executive who received them could do little or nothing with them. They weren't a bit better than the millions of accounting machines reports that have been cranked out over the last twenty years, reports intended for executives but which promptly landed in the nearest waste basket.

As one president said: *"I have to spend an hour a day reading junk and sifting through the piles of paper to find out what NOT to read."*

The international consultant, Colonel Lyndall Urwick, expressed his concept of today's administrative problem: *"An organization . . . is essentially an extremely complicated system of co-operation . . . in itself a single machine . . . in which effectiveness is dependent less and less on the quality of individual efforts . . . and more and more on the* logic *of the total design . . . and upon the precision with which each individual's contribution is geared to the overall plan."*

We've made noise about measurements. Who do we measure? The work output of some billing clerk, a girl who makes $1.75 an hour? Are we afraid to measure the results that we get from the man making $25,000 a year? Are we *afraid* of what we might find?

Standards are fine. But let's apply them to all

elements of administration, not to just a few girls doing routine work, because their work is easy to measure. Presidents, vice-presidents, managers, and yes, even systems men, should make a valuable contribution to the goal we seek.

The Miracle System

In his amazing naivete the manager looks for the magic formulae, for lanterns he can rub and wish on. He looks for magic machines and for push buttons that do his work.

The data processing men have been quick to capitalize on this. Witness the manager's glee in his punched card machines of the last twenty years, and in his electronic machines of today. This is not to say that these machines aren't good tools.

They are, if they are used as *tools* in the administrative work that needs rapid data manipulation. Computers just speed up one isolated phase of administration—bulk data processing. There is much more to administration than that.

Some management men, with a mathematical turn-of-mind, are off on operations research binges. Here, they are sure, is the answer.

Herein lies the problem. Management—the various bosses whose primary responsibility is administration—are still trying to operate like the old master and his journeyman. They dislike intangible symbols. They go through the motions of looking at reams of symbols, but the truth is they largely ignore those symbols. They still manage largely by hunch and intuition. They do not really use the techniques of scientific management. Many managers reveal their ineptness at scientific management by the way they use staff men, or the way they *don't* use them.

In one of his Washington Forecast Letters, Mr. Babson said: *"There is an* important *place in our economy for the management consultant service."*

It's amazing and also terrifying, the number of firms being operated in this country with little or no management know-how.

That's because so many businesses have grown like topsy, starting as a one-man, cash-drawer operation, then forced to expand simply on the basis of customer satisfaction.

In countless cases the top executive is the original highly skilled mechanic who is excellent in his own field but has never really learned how to be an administrator of a business. Expansion has often been conducted in a costly, poorly organized way, without any real study. Whether he knows it or not, the boss is really looking for the old-fashioned situation. He hopes to achieve, through some magical method not yet clear in his own mind, the situation of the old factory master — a fellow working in one big room, with his journeyman and his apprentices around him.

But that day is gone. Today's manager must use symbols. He must substitute information, numbers, quantities, and words, for his eyesight.

Symbolism

But the boss ducks the implication of the symbol. He gathers $2000 worth of reports on his desk. Then he flips a dime . . . and decides.

Many so-called bosses are confused by the nature and meaning of the symbols that take the place of their eyesight. They have myopia. They either see the symbols as something real in themselves or they ignore the symbol and resort to hunch and intuition.

Today, only through symbols can you possibly hope to administer. There's no other way to control the multiplex of specialties that is today's organization.

By using symbols the engineer controls technical activity, just as we *should* control administrative activity. When we shoot a missile that travels 4,000 miles, we cannot see it. We can't personally supervise its flight. Most of our flight plan must be reduced to data, to symbols, and then be built into the technological system itself.

Herein is where technology is far ahead of administration. Technology does well with its own *"systems."* Technology provides meaningful reports to the technical "manager" — to the man-on-the-ground who directs the flight of the missile. And these reports tell him exactly what is happening *now* — not what happened last month, or last quarter, or last year.

In administration as soon as there is *more* work to do, we want to hire *more* people. We need *more* budget, and this accumulation of *mores*, we think, is our solution.

Why don't we make our present resources count?

Administration does not know its own role. It wants to hire more people, get more budget, buy more machines.

The Job of Administration

It is to use our limited resources to achieve specific objectives.

Our failure is one of coordination (*administrative*) rather than the lack of enough technical men.

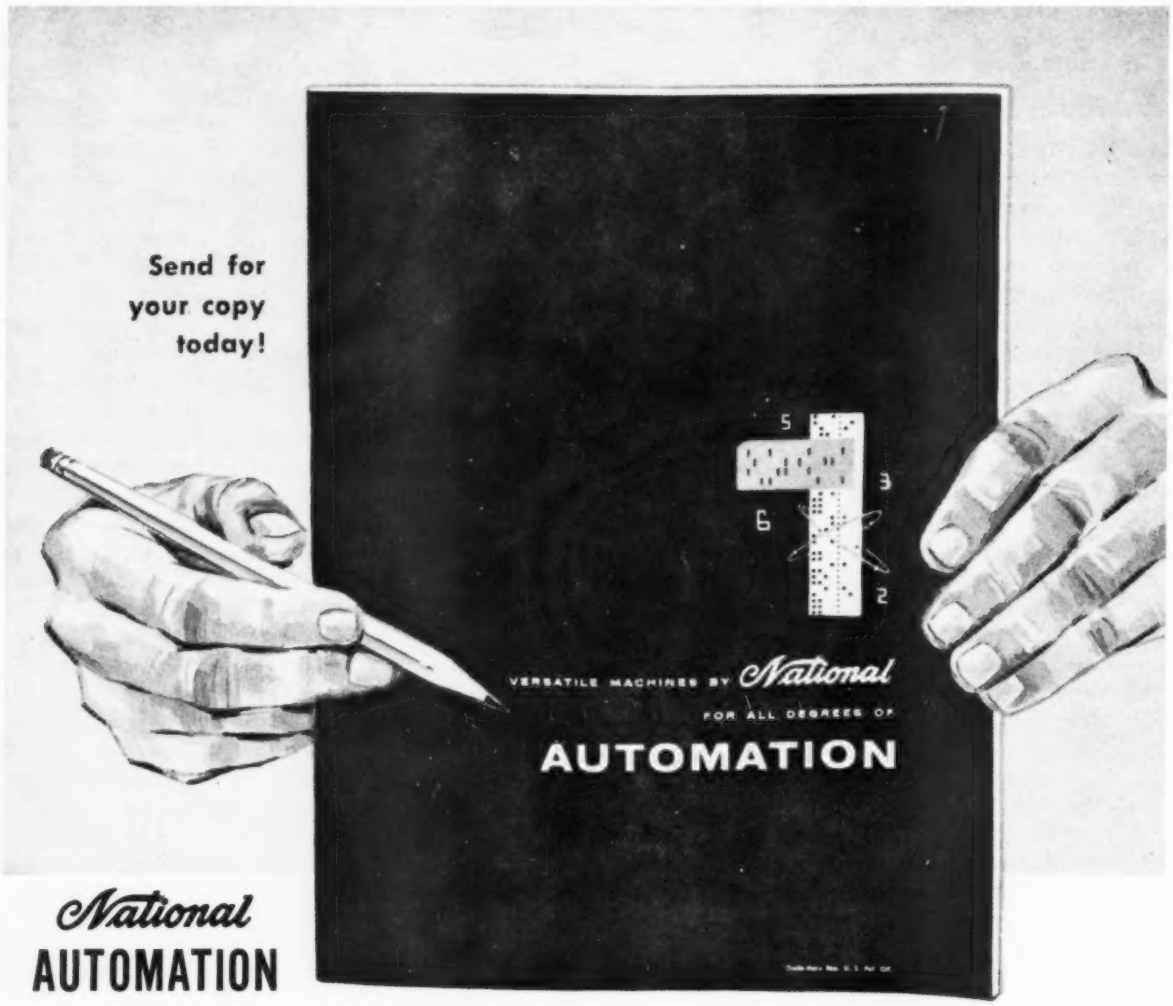
It is difficult to determine how efficient administration is today but it is *far from 100%*.

One hundred per cent would be a perfect organization. There would be no duplication, no wasted effort, and all of our resources, and our skills, would be martialed, coordinated and directed toward specific objectives.

No organization is going to attain 100%. We do not expect it. But let's assume that administration in your outfit is only about 30% as efficient as it could be. Thirty per cent sounds bad but it

(continued on page 22)

You, too, can enjoy new economy in office automation



National AUTOMATION is practical for all types of business...large or small

This brochure features the World's Most Complete Line of Data Recording Machines. It reveals how National simplifies data processing. This simplification is achieved through automatic control of the keypunch—or automatic creation of punched paper tape—all as a by-product of a necessary accounting function.

National has saved time and money for hundreds of users by eliminating unnecessary detail and making office automation more economical. This new efficiency speeds the flow of data and shortens the time required for report preparation.

* * *

For the National Story on data processing *machines and savings*, clip and send the coupon below.

THE NATIONAL CASH REGISTER COMPANY, Dayton 9, Ohio

Please send me a copy of the brochure "Versatile Machines by National For All Degrees of Automation."

Name_____

Firm_____

Address_____

City and State_____

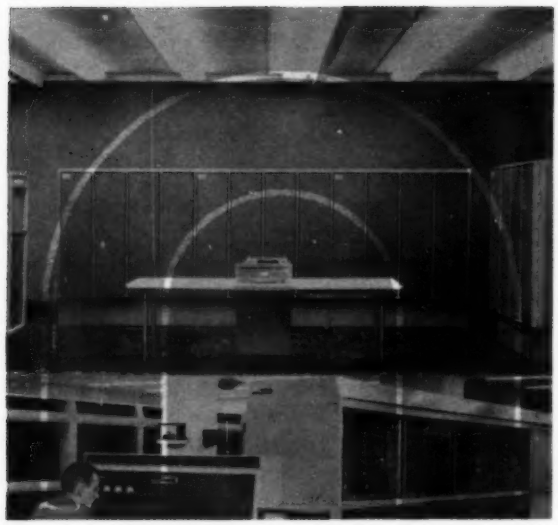
Circle No. 10 on Reader Service Card.

* TRADEMARK REG. U.S. PAT. OFF.

National*

VERSATILE DATA PROCESSING
ADDING MACHINES • CASH REGISTERS
ACCOUNTING MACHINES • NCR PAPER

1039 OFFICES IN 121 COUNTRIES • 76 YEARS OF HELPING BUSINESS SAVE MONEY.



By the U. S. Army Signal Supply Agency

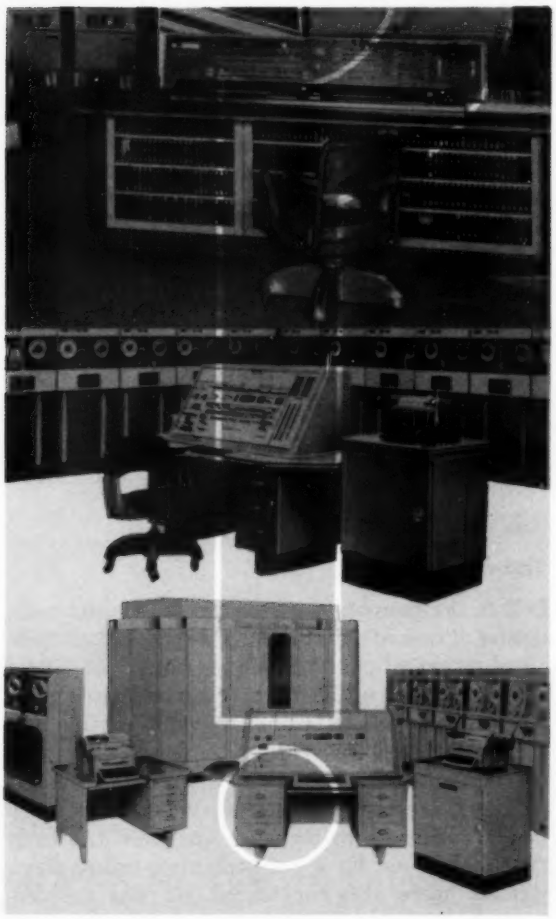
An Evaluation of . . .

EQUIPMENT for EXPANSION of DATA PROCESSING FACILITIES

A method for redesigning a computer system that has been outgrown.

A. Introduction

THIS IS A DESCRIPTION of an evaluation of data processing equipment made at the U. S. Army Signal Supply Agency, Philadelphia, Pa., for the purpose of choosing a method for expanding its ADP facilities. The study was completed in April, 1959. The Agency had to choose between recommending continuation in the system line or recommending replacement by one of seven other computers. This description of the evaluation is intended mainly to show the decision-making process used, and therefore omits details concerning specific manufacturers and their equipment.



B. Background

1. The United States Army Signal Supply Agency at Philadelphia is the national inventory control point for Signal Corps supplies and equipment consisting of almost 200,000 major tactical and minor secondary items and repair parts. In July 1956 the Agency installed a large scale computer system (*an IBM 705 system*). The initial computer was a system with a 20,000 digit magnetic core memory, a 60,000 digit drum for auxiliary storage, 10 tape units, two 150 line per minute printers, a 250 per minute card reader, and a 100 per minute card punch.

2. The initial job programmed was a daily Inventory Control and Requisition Processing application. After a year or so of growth in the scope and complexity of the program, the computer running time reached, in January 1958, about 16½ hours per day.

3. Concurrent with this increase in processing time in the basic daily job, other large applications, such as requirements computations, financial inventory management reports, and portions of major equipment supply control studies were being put into operation. These, together with testing time, brought the computer to a workload peak of about 22 hours per day, five days each week, plus Saturday and Sunday.

4. While useful results were foreseen in the automating of still other activities in the Agency, it was generally recognized that success should be

solidified in the first job before starting new ones. As a result all the available computer resources were devoted to necessary strengthening of the machine system for inventory control. In January 1958 it was realized that our machine was inadequate to provide sufficient capacity for the expansion of the existing applications, for the planned new applications and for the desired level of mobilization reserve. Although plans were under way to acquire an additional 20,000 positions of core memory, it was realized that this would not greatly reduce the total processing time. It was apparent that a more radical move would be necessary. In February 1958 we decided to undertake a formal study of the problem of expanding facilities to meet the Agency's needs. In this study we undertook to evaluate the recommendations of various manufacturers together with any other courses of action open to us. Basically, the choices we had consisted of conversion to a new line of equipment, conversion to a later model of the existing line of equipment, addition of a second 705-II, and complete reprogramming of existing applications to achieve greater efficiency and reduced operating time. An initial study showed that reprogramming could not be a complete solution because even with a substantial investment of work in revising systems and programs, there would still be need for additional capacity.

C. How It Was Conducted

1. Invitation and General Orientation

Informal invitations were sent during the early months of 1958 to the eight leading manufacturers of computers for business type applications. Each was told that the Agency was seeking more capacity and that recommendations would be welcomed for solving its problem. It was made clear that the Agency was not committed to adopting any of their recommendations at all but that facts were desired from which a decision could be made. Each interested company sent representatives to receive an Agency orientation at a gentral introductory meeting. Additional time was provided later for detailed explanations of the Inventory Control and Requisition Processing computer application. In June 1958 a formal invitation to submit a proposal was sent to the manufacturers. Of the *eight* invited, *six* companies accepted.

2. Instruction of Manufacturers' Representatives

Each company's systems group determined its own need for assistance as it progressed and individual sessions were held accordingly. Descriptions were furnished by us of the basic daily computer job, which was to be used as a "bench-mark" problem. These were supplemented by data sheets which provided:

a. Transaction volumes.

b. File sizes and formats.

c. Number of current average processing steps per input per run.

d. Number of instructions per run.

e. Printer requirements.

f. Computer room layout.

Each company worked out the timing and cost of doing the job with its machine. The following is a summary definition of the problem, the details of which were given to the manufacturers.

1. Prepare	1,000	Shipping Order/day (avg. 2 line items each)
from	600	Requisitions/day (avg. 4 line items each)
drawn on	195,000	Item Master Records
and	44,000	Due in/out Records.
2. Post	19,000	Depot Stock Accounting Transactions/Day
against	195,000	Item Master Records.
3. Post	9,000	Miscellaneous File Maintenance Transactions/day
against	195,000	Item Records
and	44,000	Due in/out Records.
4. Answer	1,000	Stock Status Inquiries/day
against	195,000	Stock Items Records
and	44,000	Due in/out Records.
5. Maintain	20,000	Customer Requisition Header Records (Name, Address, etc., required for printing shipping orders).
6. Perform supply position study on	8,000	Active Stock Items/Day.
7. Produce	400	Supply Action Recommendations/day.
8. Produce	1,000	Availability Statements/day.
9. Produce	2,500	Requisition Action Reports/day.

3. Presentation of Proposals

Written proposals and formal presentations were received from the six manufacturers in October 1958. The proposals consisted of recommendations for installation of TRANSAC, UNIVAC, RCA 501, DATAMATIC, MOBIDIC, IBM 7070 and HONEYWELL (which was announced to us later.)

D. The Decision-Making Process

1. Theory

Before the proposals were received it was realized that it would be necessary to have a method for evaluating all possible courses of action. These courses of action would have to be evaluated with respect to the objectives of the study. One approach considered was to base the study simply on a comparison of the cost to do a given job. However, there are many objectives which were very difficult to express in terms of cost and the comparison would not have been complete unless these objectives were also considered. It was decided,

therefore, that the evaluation system should consider *all* objectives including those which are more difficult to express in terms of cost.

After much consideration, a decision-making process was selected consisting of the following steps:

a. Determine a set of minimum requirements which must be met by each course of action before it can be considered for further evaluation.

b. Select the objectives which are desired by management and which should have a bearing on the decision. Some of these will be new objectives while others will merely be the retention of objectives which have already been achieved.

c. Consolidate all of these objectives into as few groups as possible, each of which can be represented as a homogeneous characteristic. These characteristics must be mutually exclusive and not contradictory.

d. Assign a numerical weighting value to each objective according to its relative degree of importance.

e. Develop a measure of effectiveness for each characteristic. This measure rates each course of action between 0.00 and 1.00 for the characteristic in question. Each machine's effectiveness is then measured for each characteristic.

f. Multiply the measure of effectiveness by the weighting value for each course of action and obtain thus a score for each machine for each characteristic.

g. Obtain the sum of the characteristic scores for each course of action.

h. Compare the total scores for the various courses of action and select the optimum one.

2. Decision-Making Process As Applied to USASSA's Applications

a. The minimum requirements which would have to be met by each course of action were deemed to be the following:

1) Can the proposed system perform the desired application and provide additional time for new ones?

2) Is the proposed system compatible with the equipment in *Signal Corps depots* or can it be made compatible with them?

3) Can the manufacturer deliver within a required period of time?

4) Can we be sufficiently assured that the manufacturer is going to continue to provide the required services?

b. A summary of the characteristics chosen to represent management objectives is given below. The relative weights of these characteristics as applied in this evaluation are also given. It must be pointed out that these weights will vary depending on the management objectives of the particular organization involved. Further, some organizations might very well have objectives which are not listed below or might wish to omit some which were considered.

	Characteristic	Weight
1)	Ability and capacity to perform data processing	25
2)	Recurring monthly cost	20
3)	Ease of programming	20
4)	Ease of conversion	15
5)	Ability to have expanded capacity in the future	10
6)	Degree of back-up of equipment and exchange of information	10
7)	Miscellaneous company services	5

c. A discussion of each characteristic follows:

1) Ability and Capacity to Perform Data Processing: The major objective of this study and the primary reason why it was begun was to acquire additional automatic data processing capacity. For this reason, this objective was assigned the highest weight.

2) Recurring monthly cost: Although in this study cost could not be considered as important as capacity, it was nevertheless the next most important objective. The cost comparison was based on the prime shift rental of the equipment rather than on the cost of performing a given amount of processing because speed is already considered as the first characteristic. Using the cost per amount of work would have assigned a double value to speed.

3) Ease of Programming: This characteristic included the ease of programming, testing, debugging and operating. It naturally had to include the degree of manufacturer assistance in the line of automatic programming and program libraries. The major reasons for its high value were that the time required to program new applications, the ability to change existing programs and the degree of program accuracy are all directly dependent on the ease of programming.

4) Ease of conversion: This characteristic included the cost and difficulty of the reprogramming of all existing applications, of the conversion of tapes, of the parallel operation of the two systems and of the physical replacement of the equipment. It was less important than the first three characteristics because its impact is one-time in nature. However, it was nevertheless very important to make any conversion as easy as possible both from a dollar and from a manpower standpoint.

(continued on next page)

5) Ability to Have Expanded Capacity in the Future: This characteristic included the ability to easily reduce the processing time in the future by the adding of machine components, the ability to add units of magnetic core or other kinds of memory, and the ability to add magnetic tape units.

6) Degree of Back-up of Equipment and Exchange of Information: This characteristic concerned the existence of alternate installations for physical back-up in the event of non-function of the USASSA computer, and the degree of interchange of information which is expected to take place between users of similar lines of equipment. Although its importance was minor in nature it could not be ignored.

7) Miscellaneous Company Services: This characteristic covered the availability of educational facilities, literature, customer engineering support, technical assistance and general customer support.

E. Evaluation of Equipments for USASSA's Job

1. Initial Screening

The systems analysts assigned to the proposal evaluation began their work by reading and studying each of the six proposals. Emphasis was placed on determining the completeness of the proposals as well as on obtaining a familiarity with the approach followed by each manufacturer.

At this time, the committee compared each proposed system and its manufacturer with the set of minimum requirements. It was found that all of them passed all these tests. Each system was found to be able to perform the desired applications and provide additional time for new applications, was compatible with the Signal Corps depots' equipment, could be delivered within a suitable period of time, and was offered by a manufacturer that we felt was going to continue in the data processing equipment line and continue to provide the required service.

2. Scoring by Criterion

a. Ability and Capacity to Perform Data Processing

As there are many different facets of computer processing which can be considered under this criterion, it was recognized that there was a need for a valid test which would display all these facets of each machine as they relate to the Agency's data processing application. It had already been decided that the daily Requisition Processing and Inventory Control job was the one most typical of present and proposed applications. It was felt that the time required for each system to do this standard job would provide a valid comparative measure.

The limits of the measure of effectiveness were determined as follows. The upper limit on timing was selected as the maximum number of hours of processing time which was considered acceptable for the application under study. The lower limit on timing was set at the time required by the fastest machine. Thus the fastest machine received a measure of effectiveness of 1.0 and any machines which might have required the maximum number of hours would have a measure of effectiveness of 0.0. All other machines would have a measure of effectiveness between 0.0 and 1.0 directly proportional to their speed.

Although all manufacturers' systems analysts were given the same orientation and the same set of statistics, there were considerable differences in the systems approaches which they followed. The methods and timing also varied and for these reasons it was necessary to standardize certain timing factors, to select the optimum equipment configuration and to adjust the timing estimates as required.

The timing of a proposed system was measured by calculating the set-up time, the tape passing time, and the compute time, and then determining the degree to which these operations could be overlapped. The tape passing time was defined as the sum of all start stop times and the time required to pass all information at tape speed. The compute time was calculated by multiplying the total number of instruction steps required by a system by the rate at which the machine performs instructions. The amount of overlap varied with the capabilities of the proposed equipments and had to be treated in great detail.

b. Recurring Monthly Rental

The prime shift rental of the complement of equipment which was required to achieve the processing time stated in paragragh 2a above was used as the basis for measuring this characteristic. A measure of effectiveness of 1.0 was assigned to the least expansive machine. The minimum measure of effectiveness of 0.0 was assigned to a complement of equipment which would cost for the prime shift rental an amount which was considered the maximum acceptable. The amount selected as a maximum was an average of the total monthly Agency ADPS rental over a recent period of months. It was felt that it would not be desirable to surpass this figure for the prime shift rental of any new equipment.

c. Ease of Programming

As this characteristic is more qualitative in nature than the first two characteristics, the assignment of numerical measures of effectiveness was a more difficult problem. By subdividing the characteristic into its most significant components and dividing the point total among these components according to their own relative importance the problem was made easier. The following three sub-characteristics were identified:

1) The Degree of Automatic Programming Available. The most important consideration by far in judg-

ing ease of programming was felt to be the stage of development of automatic programming techniques which free the programmer from having to concern himself to such a great degree with the intricacies of the machine language. A large library of routines enables the programmer to drastically reduce the number of instruction steps which he must write. Service routines and a basic compiler are an absolute necessity and it is only by higher levels of automatic programming that the desired ease of programming can be achieved.

2) The Internal Machine Language. Whether or not there is an automatic programming system, the amount of difference between the machine language and human language still has a bearing on the ease of programming. It is of concern to the programmer in some instances, especially in debugging, machine operation, analysis of memory dumps, and detailed instruction manipulation. The closer the machine language is to human language the easier is the programming.

3) Compatibility with Existing Programming Philosophy. These points might have been assigned for measuring only the degree of difficulty connected with any *new* machine's programming philosophy. The degree of difficulty might depend on whether the fields, words, and records of information are variable or fixed in length and on the approach to data format, movement and manipulation. There are many arguments for and against each type of philosophy and still considerable debate as to which is the best. However, in this particular case, where the question was one of conversion from one system to another rather than of an initial installation the major consideration had to be the degree of change from the existing programming philosophy in the Agency. Although this may seem like a factor to be considered only under "ease of conversion," its effect is one which cannot be limited to the conversion period alone. The need to acquire experience in a new type of programming philosophy would affect the ease of programming for some time after the completion of the conversion.

d. Ease of Conversion

Although some of the components of this characteristic are difficult to express in terms of dollars, it was decided that a dollar measurement would be the best method of comparing the various courses of action. Among the effects of a large conversion which were *not* considered, however, were the effects of the impairment of the existing system's ability to respond to changes during the conversion period and of the delay which would result in new applications because of the conversion program. The major costs which *were* evaluated included

(continued on next page)

Coming Events

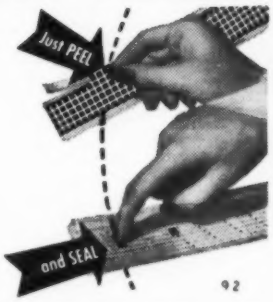
March 21-24	IRE National Convention Coliseum and Waldorf-Astoria Hotel New York City
April 20-22	Data Processing: Punched Card, A.M.A. Workshop on Organization and Management New York City
May 2-6	Western Joint Computer Conference San Francisco, California
May 22-26	41st International Conference and Office Exposition of the National Office Management Association Montreal, Canada
June 14-17	Cornell University Industrial Engineering Seminars Ithaca, New York
June 22-24	1960 National Conference and Business Show of the National Machine Accountants Association San Francisco, California

CORRECT KEY-PUNCH ERRORS

with BRADY self-sticking

CORRECTION SEALS

Made of super-thin Mylar® . . . feeds freely, won't jam equipment. Highly visible opaque red color easy to spot. Fast to apply. Low in cost. Order red and transparent seals from stock; silver on special order. Send for free sample.



Circle No. 11 on Reader Service Card.

W. H. BRADY CO. • 793 W. GLENDALE AVE. • MILWAUKEE 9, WIS.

Manufacturers of Quality Pressure-Sensitive Tape Products • Est. 1914

SALES OFFICES: Atlanta • Boston • Buffalo • Chicago • Cincinnati • Cleveland Detroit • Hartford • Los Angeles • Milwaukee • New York • Newark • Philadelphia St. Louis • San Francisco • Brampton, Ontario, Canada

those incurred in training of personnel, physical conversion of equipment, parallel operation and the programming effort. The reprogramming of the daily job on which the proposals were based was calculated to be one third of the total reprogramming effort. In computing training cost, the assumption was made that less schooling would be required in training for a binary coded decimal machine than for a pure binary machine.

e. Ability to Have Expanded Capacity in the Future

This characteristic was measured to show degree of insurance against reaching the computer's maximum in capacity and in system flexibility. The scoring measured the ability to add features in the future which do not have to be paid for until they are required. The characteristic's points were subdivided into three components as follows:

1) The possibility of further reduction in the initial processing time as stated in characteristic a: Credit was given under this component to any proposed system which omitted unessential devices from the proposed configurations, even though running time reductions were possible. An example of this was a multiple sequencing unit which would allow simultaneous operation of more than one tape unit but which was not recommended initially for the Agency.

2) The ability to expand memory: Under this subcharacteristic, credit was given for features permitting the adding of extra units of magnetic core memory and the use of magnetic drums or random access disc storage.

3) Ability to expand the number of tape units: The most important of the expansibility considerations for the Agency's application was to be able to add a few tape units. As the number of possible extra units rose, less and less additional value was credited to them.

f. Degree of Back-Up of Equipment and Exchange of Information

The total number of machines that were currently installed, together with a projection of the number of machines that would be installed in the future, was used as a measure for the degree of back-up of equipment. It was felt to be very desirable to have one or more of these machines in the vicinity of Philadelphia. The number of machines installed or on order was also a good measure of the amount of information interchange which could take place. This is particularly true where the users and the manufacturers join together in an organization for the development of new programming techniques and the interchange of other information.

g. Miscellaneous Company Services

Although it was very difficult to select a measure of effectiveness for this characteristic it was found possible to rank the manufacturers relative to each other. The ranking was based on their past experience and performance, on the amount of effort they were now putting forth in these areas and on estimates of their ability to provide these miscellaneous services in the future.

F. Conclusion

By using the system described to make the evaluation, the Agency was able to decide on a definite course of action. Presentation to higher management levels was very successful, in that it was possible to show in a very concise form a complete consideration of all possible actions in light of all the management objectives. ■

. . . Art in Administration

(continued from page 15)

is probably not too far from the truth.

No one really knows, of course. The exact percentage doesn't matter. The point is that we are a long way from 100%.

Improvement Is Relative

While the effectiveness picture may not be bright, it does carry a note of encouragement.

If you're bad enough, you don't have to improve much before you can make a big difference.

If we are 30% efficient — and let's assume that we are — then a 2% gain, climbing up to 32%, can make a big difference.

And it wouldn't take much change in our administrative effectiveness generally to achieve such a modest improvement.

The first part of the improved administration program in the 1960's must come from our own realization that administration improvement is lagging. We must first find the art of administration as it exists today. We must "capture" the best ways of doing work today.

Once we have captured the present bundle of *one-best-ways* then we can push hard on the barriers of our current knowledge.

First, let's take an administrative inventory. Chuck out the junk and retain the valuable goods. Then push outward. Start to probe beyond the barriers of the tried-and-proven. Next, develop new valuable goods, items not available before.

We must share the good word with our administrative brothers.

The systems man must remember that he is a staff man. He guides, he advises, he needles. He is a man who helps others do *their work*. If you think of administrative tools as ends in themselves, you cannot truly contribute to improved administration in 1960.

Don't revel in techniques alone. Don't get yourself lost in the *means*. Keep in sight the real *ends*.

■ ■ ■

By B. W. Taunton

"NAME CODE"

A Method of Filing Accounts Alphabetically on a Computer.

THE BASIC PROBLEM was to maintain records in alphabetical order with respect to each issue of stock for which The First National Bank of Boston acts as Transfer Agent, and to post on an average some 6,000 transactions per day to the file of over 900,000 accounts. Classically, the only practical way that this has been done on any kind of automatic or semi-automatic equipment has been to assign to each account a number in such a manner as to preserve the alphabetic sequence in the file. This is quite different from most applications where files may be maintained in numerical sequence, with little or no regard to alphabetic order and where an account number may be recorded on most input media. Unlike the latter instances, in transfer work every transaction must be referred to the file and a number assigned to it—a task which is time-consuming and laborious. It is costly as well. Some Transfer Agents have expressed the opinion that the added cost of this work is sufficient to offset any savings that might be realized from the use of mechanical or electronic equipment.

The Bank felt that the problem could be resolved by using the computer to generate its own key, or account number, which would serve to maintain the file in alphabetical order and also be sufficiently unique to enable the machine to locate accounts in the file and post to them, as well as to insert new accounts in their proper position. This led to the development of *"Name Code."*

Set of Rules

It might be defined as a set of rules under which the computer automatically selects 16 alphabetic characters from the stockholder's name, or the legal title in which the stock is registered. These characters are thereafter used by the computer for sorting, filing and posting operations in place of an ordinary account number. In general the routine defines as a *"word"* any character or group of characters in the title that are followed by a space. To the computer "Charles R. White" is three words. Certain words commonly found in titles are momentarily accepted, recognized, and then rejected in generating the code. These are *"in"*, *"the"*, *"and"*, *"of"*, and the ampersand symbol (&). *"Miss"* and *"Mrs."* when they appear at the beginning of a stockholder's name are similarly rejected in generating the code. Since, of course, the computer itself is unfamiliar with a filing system as such, it is necessary that the basic word in the title, under which the item is to be filed, be keyed so the computer may recognize it. This is accomplished by having the typist, when she prepares a new stock certificate or a record with respect to its transfer, place one or two colons in the proper location in the title. Actually, the typing operation results in only the high dot appearing on the document being prepared, since the bottom dot has been removed from the type bars on the typewriters that are being used. This dot permits visual examination of the source data to determine that the colon has been properly positioned. As a by-product of the typing operation, punched paper tape is prepared, which is subsequently used as input to the computer system.

Input

There are only two simple rules which the typist must follow in preparing the original documents. She must place one colon in the space which would otherwise appear im-

(continued on next page)

FIGURE 1

```
 1
·ANSCOT

  2   1
WALTER·JONES

      2  3    1
MRS ALICE W·WHITEHILL

 2  3  1  4
JOHN F·SMITH JR

  2     1          3     4     5
JAMES·MAHONEY AND JANE MAHONEY COOWNERS

        2  3   1          4
MISS JOYCE M·BANWICK AND MISS

 5  6   7   8  9  10
JANE N BANWICK JT TEN ETC
```

mediately before the word in the title under which the account is to be primarily filed. If a fiduciary is named, a second colon must precede the given *(first)* name of the first beneficiary mentioned; if no beneficiary is mentioned, then the second colon must precede the surname of the principal. Under a carefully defined set of rules, the computer then proceeds to extract from the colonated words, and from other words in the title, the key of 16 alphabetical characters. These characters are chosen as a strict function of the number of words in the title.

Of course, in any reasonably large file there is a great deal of similarity in names or titles; in fact, precisely the same name may appear frequently. Since the code is based upon the name, and name alone, duplicate keys also appear. In experiments with its own stockholders' list of approximately 23,400 accounts, the Bank found that it had a total of 686 redundant keys; to put it another way, 97% of the keys were unique, 3% were redundant. The program, therefore, had to take cognizance of the fact that redundant keys could and would exist. Approximately one-half of the day's transactions are debits—certificates of stock being surrendered for cancellation as a result of a sale or some similar activity on the part of the stockholder. In each case a certificate number is known and must be recorded. Hence, the computer is instructed, when it finds an account with a key the same as that on the transaction to look for the number of the certificate being surrendered, and if it finds that it and the number of shares agree, and it has not been previously recorded as surrendered, to post the surrender date and adjust the ledger balances accordingly. This reduces the redundancy factor to 1½%—instances where credits, or certificates issued, are involved.

Elimination Routine

In this instance, the computer is instructed to check the file to see if one or more accounts have the same key as that developed from the title on the new certificate and, if such redundancy does exist, to examine each word in the title of the certificate and compare it with that on the file and if a similarity still exists, to check the street address of the stockholder, word for word. If these comparisons are satisfied, the certificate is added to the account. If the comparison is not satisfied, a new account is opened and the certificate posted to it. The program is such that the only mistake that the computer can make is to open a second account for a stockholder when he should have but one such account. This, of course, might be the result of some minor variation in the way an address is stated, which would be obvious to a human being. To guard against this possibility, however, the computer, whenever it opens a new account on the file and there are one or more accounts already on the file with identical keys, reports the new accounts opened and the details with respect to the other account, or accounts, with the same key. This report is then subsequently scanned to determine whether or not the new account should be consolidated with one that is already on the file. The Bank's experience to date indicates that there are only *three* or *four* such items to be examined each day.

The Bank has operated this routine on its computer now for a number of months and, after exhaustive tests with about 10% of its files, it has determined to proceed with the work of converting the remaining 810,000 accounts to this system.

"Name Code" is a practical solution to the problem of maintaining large files in alphabetical order where the volume of daily transactions is relatively small—in the case of the Bank 67/100 of 1% of the accounts on the file are affected daily. The calculation of the key is relatively slow, by computer standards, and *could* become a significant factor in an active file. Hence, the code is *not* designed to substitute for numerical filing systems where they may be used. The latter are normally the most efficient in machine operations.

FIGURE II

SAMPLES OF TWO-WORD ACCOUNT CODES GENERATED FROM TITLES WITH:

ONE WORD:	·ALCOATING 40 GREEN ST BOSTON MASS	ALCOATIN	--------
TWO WORDS:	WILLIAM·ANDERSON 566 GENEVA AVE NEWTON MASS	ANDERSON	WILLIAM_
THREE WORDS:	MRS WALTER GEORGE·BERNARD 70 STOKES ST MORESTOWN N Y	BERNARD_	WALTERGE
FOUR WORDS:	WALTER GEORGE·BERNARD JR 70 STOKES ST MORESTOWN N Y	BERNARD_	WALTGEJR
FIVE WORDS:	JAMES·CALLISTER AND MARY CALLISTER JTRS 220 SOUTH ST BURLINGTON MASS	CALLISTE	JAMMCAJT
SIX WORDS:	MRS MICHAEL PETER·DEMPSEY AND JOHN DEMPSEY COOWNERS 120 COLBERT AVE BOSTON MASS	DEMPSEMI	CPJODECO
MORE THAN SIX WORDS:	MISS CLARA KATHRYN·EMERSON AND MISS MARY ELLEN EMERSON JT TEN ETC 132 RUE ST BOSTON MASS	EMERSOCL	AKMIMAEL
MORE THAN SIX WORDS WITH A SECOND COLON BEYOND THE SIXTH WORD: (FIDUCIARY ACCOUNTS)	PHILIP H·FRIEDMAN AND FREDERICK S BENSON JOINT TRUSTEES U/W/O THOMAS B HARRISON F/B/O·MARY HARRISON BOX 332 WHITMAN MASS	FRIEDMPH	IHFRMARY
	PHILIP H·FRIEDMAN AND FREDERICK S BENSON JOINT TRUSTEES U/W/O THOMAS B·HARRISON BOX 332 WHITMAN MASS	FRIEDMPH	IHFRHARR

Announcement

DATA PROCESSING EDITORIAL COMPETITION

Sponsored by Gille Associates, Inc.

Purpose

This competition is designed to foster an exchange of ideas on all important phases of office data processing systems.

A by-product of the competition is to encourage data processing and systems managers and office executives to document their procedures to effect more efficient departmental operations and control.

Although most feature material appearing in our publications is staff-written or obtained to fit a predetermined editorial plan, contributed material is also included when it is judged to have sufficient value. This recognition encourages creative activity in the data processing field.

The result of the competition will therefore make new material and ideas available for publication.

COMPETITION PROCEDURE

1. ELIGIBILITY

Any person, except those employed by manufacturers or suppliers of data processing equipment or supplies or data processing service organizations, may enter this competition by submitting a paper in accordance with the specifications that follow. Papers will be judged on the basis of **idea content** rather than writing ability.

Any eligible person may submit as many papers as he chooses — each must conform to the specifications that follow.

2. SUBJECTS

Papers submitted must be related primarily to one of the following categories and include the use of **punched card or punched tape equipment or digital business computers.**

- **Payroll**
- **Production Control**
- **Sales Analysis**
- **Accounts Payable**
- **Accounts Receivable**
- **Billing (Invoicing)**
- **Coding**
- **Inventory Control**
- **Order Processing**
- **Collections**
- **Control Panel Wiring (Unique Applications)**
- **Forms Improvement**
- **Other, or General (Author to Specify)**

3. Papers must be typewritten, double-spaced on standard size 8½ x 11 inch white paper and be at least three pages in length.

4. Copies (original or reproducible duplicates, photostats **not** from office copying equipment) of all pertinent forms, cards, diagrams, etc. must be submitted with papers. Flow charts and other hand-drawn charts need **not** be in reproducible form but can be freely drawn in any legible medium such as sharp pencil or pen. (These will be re-drawn by our artists if used.)

5. **a.** On a separate 8½ x 11 inch sheet the author's name, employment affiliation, title and address (company or home) and telephone number must be given.

   b. Also a suggested title for the article must be included. This title should be descriptive of the main point of the article. The subject category (one of the 13 in item 2) should appear in the upper right hand corner of this sheet.

   c. Your general industry classification must be included in upper right hand corner of this same sheet, using the following guide:

   MANUFACTURING
   DISTRIBUTION
   INSURANCE
   GOVERNMENT
   TRANSPORTATION
   UTILITIES
   BANKING
   EDUCATION
   OTHER (Specify)

6. References to quotations or technical information must give the source of data in footnotes.

7. On a separate 8½ x 11 inch sheet, the author must furnish information on his background, experience and related biographical data. This information shall not be a factor in judging papers but is for publication purposes only.

8. All authors whose papers are published shall receive a certificate of merit and a copy of the publication in which paper appears, in accordance with terms stated in item 13. All other material will be returned. **See item 10.**

9. All papers received will be acknowledged. Notification of acceptance will be made prior to publishing.

10. The sponsor will take every reasonable precaution to assure safe and complete return of material submitted and not used for publication, however, it cannot be responsible for inadvertent loss of material or portions thereof.

11. Our editors will have the right to edit any paper submitted.

12. The sponsor at its option may publish any material submitted in any of its publications provided the material is credited to author and awards made as stated in item 13.

13. **AWARDS will be made as follows:**

A total of $1300 will be awarded for "best in each category" as follows:

a. $100 and a Merit Plaque to the author of the paper adjudged by our editorial committee to be the best in each of the 13 categories listed in item 2. If paper has been written by more than one author a single cash award will be made to be divided between authors. This award will be made at the end of the competition period. **See item 14b.**

b. A certificate of merit will be issued to the author of each article published. This award will be made as material is published.

c. A copy of the publication **(periodical or book)** will be sent to each author whose paper is published.

d. The decision of the sponsor's editorial committee will be final in the judging of papers, the assignment of awards and the use of material submitted.

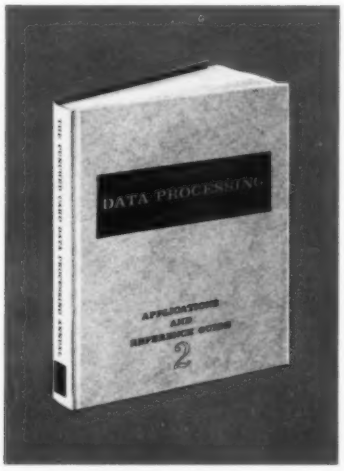
e. Papers must be sent to:

GILLE ASSOCIATES, INC.
956 Maccabees Building
Detroit 2, Michigan

14. a. Competition commences February 1, 1960 and ends January 31, 1961.

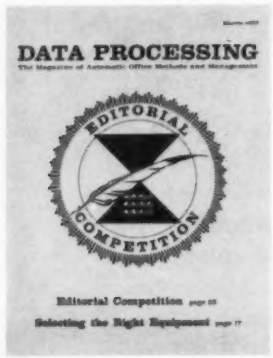
b. Awards for "best in each category" **(item 13a)** will be made within 90 days after end of competition.

15. Although competition is confined to the period stated in item 14a, material judged acceptable may be published prior to end of competition according to the following schedule:



THE PUNCHED CARD Data Processing ANNUAL,
Vol. TWO, 1960, issuance date July 30 — material received prior to April 1st will be considered for possible inclusion.

(continued on next page)



DATA PROCESSING Monthly Magazine

— material received by 10th of second month preceding month of each issue will be considered for that issue.

INDUSTRY and APPLICATION HANDBOOKS

(22 different handbooks, first editions scheduled for completion March 31, 1960)

Material will be used for **new editions** to be published on a continuing basis.

16. All papers submitted must be **accompanied by** the following statement signed by the author:

AUTHOR STATEMENT

To: **Gille Associates, Inc.**
956 Maccabees Building
Detroit 2, Michigan

This statement or a facsimile must accompany each paper submitted.

The enclosed paper, titled _____

_____.

is submitted for consideration in the Editorial Competition. The subject category (see item 2 in procedure) is:

_____.

My industry classification (item 5c) is: _____

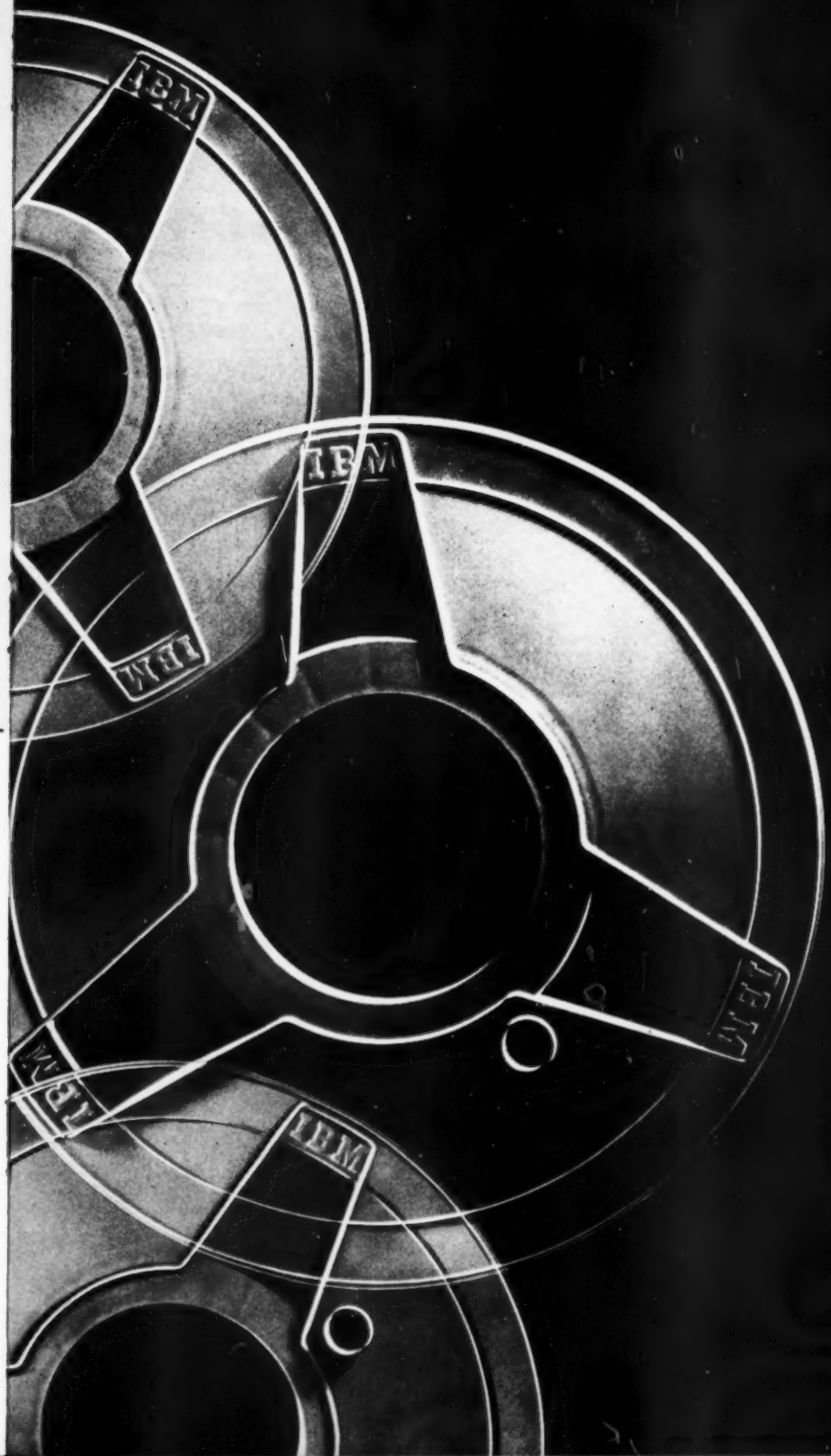
I am the sole author and owner of this paper. It has not been published previously, is not in the public domain and does not infringe on any copyright.

I hereby assign to Gille Associates, Inc. all of my rights to this paper, including the right to copyright said paper in its name and to edit it at its option in accordance with the terms set forth in the Competition Procedure.

I have read the terms governing this Competition and agree to be bound by them.

Date _____ _____

Signature



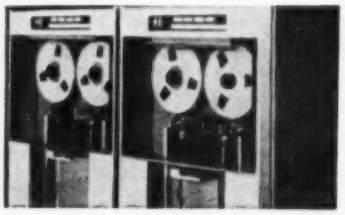
A new life for old tape ...through IBM service

IBM offers a unique customer service: RECLAIMING OF USED IBM MAGNETIC TAPE. At a nominal charge, this service provides for complete testing of a reel of tape and removal of all nonpermanent defects accumulated during use. Where it is not possible to reclaim the entire reel of tape, we will—at no extra cost—remove the longest perfect section and return it to you.

Of the thousands of reels of tape tested during the past two years, *over 50% were returned to the customer intact, completely free of contamination ... ready for a new life of service.* Of the remaining reels tested, many were returned to the customer with long sections of perfect tape.

The very concept of reclaiming used tape stems from the confidence we have in the quality of our Magnetic Tapes. We know the quality is there because we have never taken for granted either the accuracy or the durability of our Magnetic Tapes. Every bit ... of every inch ... of every reel ... of IBM Magnetic Tape ... is tested for perfection. We leave no margin for error—nor should you—for the cost of reliable tape is insignificant when you consider the savings which result from its use.

Your local IBM Sales Representative will explain how you can save by using tested and *retested* IBM Magnetic Tapes ... and how, in many other ways, IBM helps you to enjoy Balanced Data Processing.

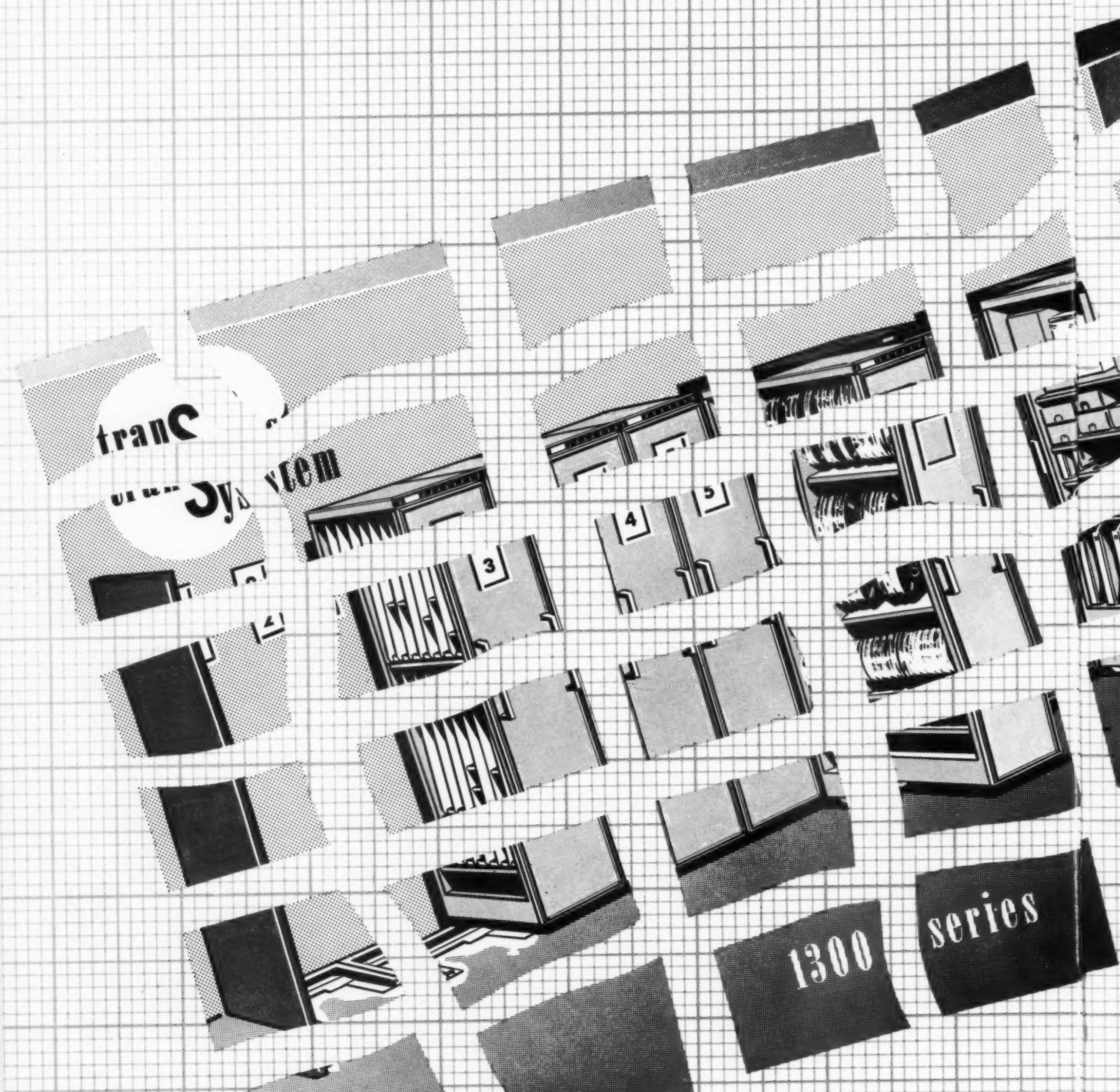


IBM®

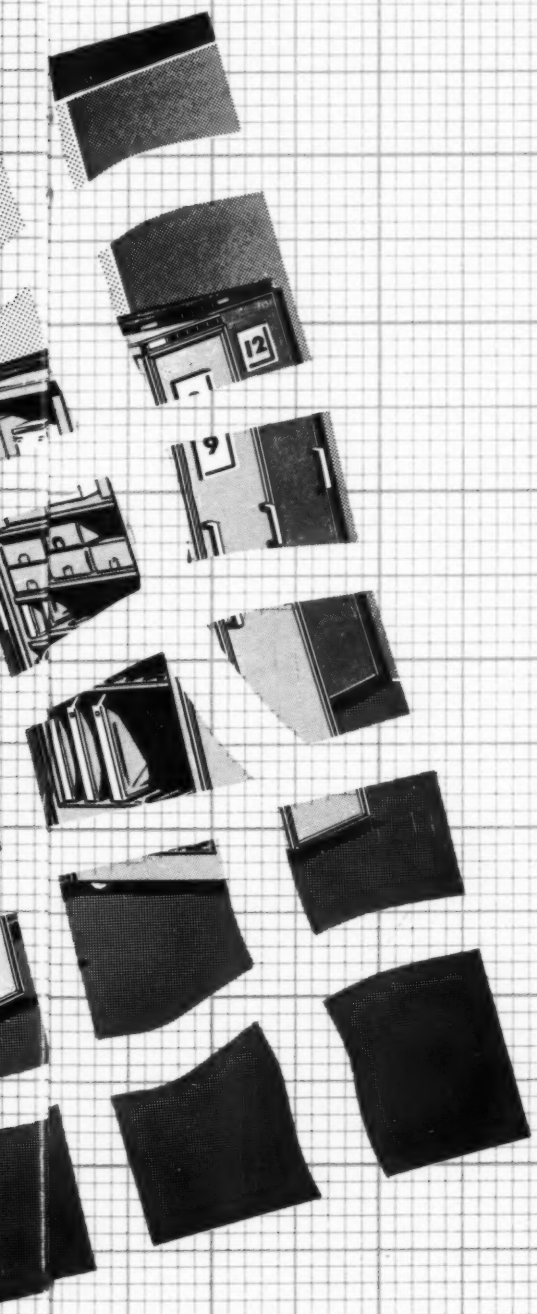
SUPPLIES

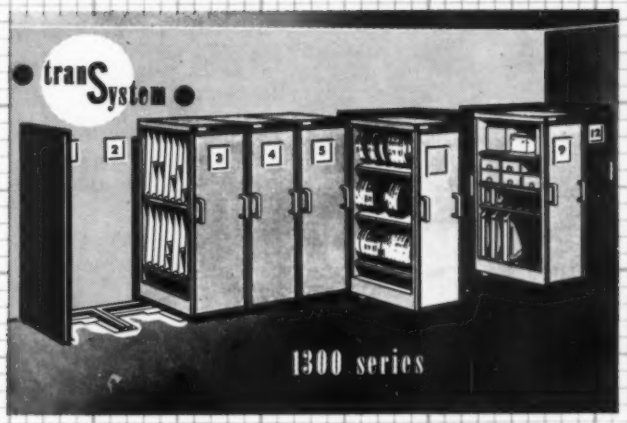
Circle No. 12 on Reader Service Card.

ALTOGETHER . .



A Ray M





- a
- new
- achievement
- in
- concept
- and
- design

Myers Product

ENDICOTT • NEW YORK

Circle No. 13 on Reader Service Card.

NEWS SUMMARY

GENERAL

The unaudited figures of the *Standard Register Company* show a 12% increase over 1958. Sales were $51,950,460 with net of $3,262,082, compared to $46,489,170 and $1,884,299, respectively, for 1958. Earnings were $3.27 per share for 1959; $1.91 in 1958. First quarterly dividend of $.35 was declared.

Sales Reports

Control Data Corporation's semi-annual figures showed net sales at $3,889,273 and net income of $249,518 compared with $1,462,685 and $31,697 respectively for the same period of 1958. Earnings were $.27 per share in 1959, $.04 per share for 1958. The company's order backlog totalled $7,700,000 as of December 31, 1959.

The *Business Forms Institute* noted a dollar volume gain of 14% in 1959 over 1958. The forms industry had sales of $350,000,000 in 1958 and final figures for 1959 should show a $400,000,000 sales volume for the year.

Honeywell 800 Deliveries in October

The *Datamatic Division of Minneapolis-Honeywell* dedicated its new marketing and training center at Wellesley, Mass. and also announced sales figures for its Honeywell 800 computer system. The division has an order backlog in excess of $35,000,000 with the first prototypes nearing completion and the first deliveries to be made in October of this year.

Da-Span

Radio Corporation of America announced a new communications system which will enable branches to become integral parts of the head office. The system utilizes telephone or teletypewriter lines for transmitting data to and from a central processing system. The system, called Da-Span (data-span), is in essence a data pipeline system to a computing system.

NEW APPLICATIONS

An electronic computer is slated to tackle the immense mountain of paperwork handled by the N. Y. State Labor Department's Division of Employment to keep up with the records of more than 400,000 employers who were covered by *unemployment insurance* beginning January 1. The equipment, to be installed at the agency's Albany headquarters by January of 1961, is the first of its type to be used on a large scale in the state government and will result in savings of $750,000 a year after it is in full operation. Rental cost of the equipment will be $19,650 a month.

IBM 7080 for Railway

The Southern Railway System is the first railway and one of the first companies in any industry to order the newly-developed, transistorized IBM 7080 data processing system. The 7080 will be installed in the railroad's Computer Center in Atlanta to replace an IBM 705 Model III. Major jobs handled by the 7080 will include *interline freight accounting*, extended development of *traffic statistics, stockholder record-keeping* and *payroll processing for over* 25,000 System employees.

First Data-center Customer

Shell Oil Company became the first data processing customer at IBM's Data-center in the mid-town Manhattan Time and Life Building. Shell inaugurated the approach to data processing by renting time by the hour on the Data-center's IBM 709 to calculate the *economics of petroleum distillation methods*. Shell is also using the Data-center facilities to *ready programs and operations* for installation of an IBM 7090 data processing system.

"Parent" Computer

The Datamatic 1000 is being used by the Datamatic Division of Minneapolis-Honeywell to *produce a second generation* transistorized data processing system, the Honeywell 800, which will be produced at a rate that would be impossible if the "parent" computer were not available to help with the job. Six months in the engineering and design departments will be saved from the time of the original conception of the system's design through the testing out of the first prototypes. Some 10,000 drawings of electrical circuits that otherwise would have been required have been eliminated and replaced by lists of tables and symbols recorded on magnetic tape by the Datamatic 1000, the parent computer.

1604 for Navy

Control Data Corporation announced the delivery of a 1604 transistorized computer to the U. S. Naval Postgraduate School, Monterey, California, which will be used for *training Naval personnel* and in *computer center operations* associated with the Department of Mathematics and Engineering at the Postgraduate School. The 1604 will also be used for *weather prediction*, for *weather data processing* and for *special Navy applications*.

The author, William K. Donald, is shown with Tabulating Supervisor Helen Wilkes at her desk (background).

By William K. Donald

BILLING with Punched Card Methods

This Card-O-Matic—Univac 60 billing system was installed smoothly, without upset to the organization's structure.

THREE YEARS AGO we realized that sooner or later we must take a long, close look at new ways of handling the heavy volume of paperwork which had become an oppressive, though unavoidable, burden to our business.

Masback Incorporated is a wholesaler of hardware and allied lines in the New York area. Sales volume is substantial with approximately 24,000 different items carried in stock that are purchased from nearly 2,000 vendors. We sell to about 5,000 customers. The volume is made up of about 15,000 individual billings each month, depending upon the selling season. Since orders average between eight and ten items, or about 130,000 "lines" per month, we must process about a million and a half individual "sales" (or lines of billing) each year to achieve this volume.

Our studies embraced many data processing systems and ultimately led to the selection of Remington Rand punched card equipment, beginning with their Card-o-Matic as the point of entry into a standard punched card operation, and including the recent addition of a UNIVAC 60.

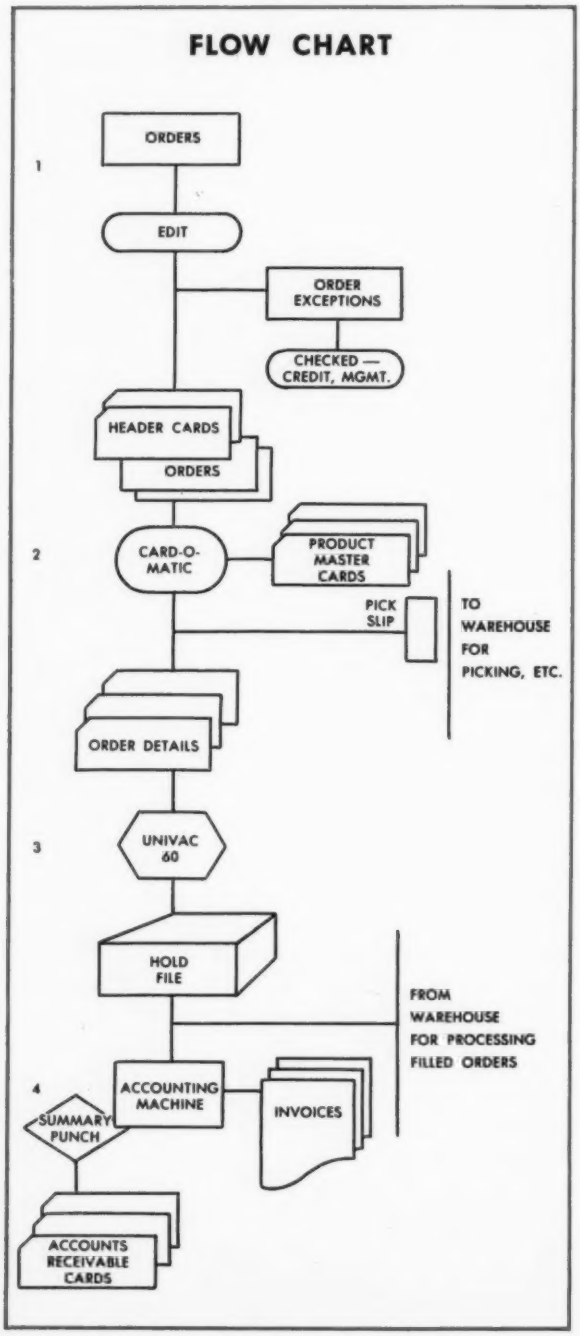
THE SYSTEM

A salesman jots down item descriptions on a form as the customer calls out the items wanted, and sends in the order. He enters only a three-digit manufacturer code next to the quantity ordered. No price data are necessary, unless the customer is entitled to a quantity price. Card-o-Matic operators find the card area in the card file by code, and pull the proper product master card by description, automatically reproduce the order, customer and salesman's numbers, and key in the quantity. When this card is run through the UNIVAC 60 the selected price is multiplied by the quantity for billing. When run to produce an invoice, the suggested retail or list price is provided as a guide to the retailer. The entire operation is based on a set of control master cards — one such card for each individual item by sizes and colors stocked — containing all information necessary for the several related applications of warehouse ordering, *customer invoicing*, purchasing, and inventory control. These master cards are never removed from the department. They are created initially from information supplied by our buyers: item description, selling price, warehouse location, item code, cost, commission code, packing and list price. From these control master cards we reproduce three sets of color-coded working master cards: Buyers' Masters, *Product Masters* and Purchase Order Masters.

(continued on next page)

Product Master cards are utilized for order writing and billing procedures. In reproducing this set from the control master card, factory cost is omitted but the landed cost is retained.

Separate sets of name and address cards are also prepared — one for vendors and one for *customers*. Customers with poor credit standing are flagged by using a special colored card. Orders for such customers must be passed to the Credit Department for review and approval before reentering the main data processing stream.



1. Incoming mail orders, picked up at the Post Office at 6:00 a. m., are checked by the *"editor"* against the truck run schedule and scanned for exceptions. Orders requiring management or buyers' attention are removed for referral, as are those later found to require credit approval.
2. The order, with its header cards, is next directed to one of several Card-o-Matic operators, who control files of various capacities, from 12,000 to 30,000 Product Master item description cards. The Card-o-Matic operator reproduces the order number and the name and address cards, then selects the proper item master card for each line (*item*) of the order, and keys in only the quantity and price code. Each item card so produced is complete for order writing. The detail cards come out in exactly the sequence required for this operation and for subsequent billing. Single copy warehouse orders are now prepared.
3. While the order is being *"picked"* or filled, the cards are computed and filed by order number. The computer multiplies the quantity by the selected price to produce and punch the amount of the sale.
4. When the "filled" warehouse order is returned, these cards are pulled and the same detail cards used to prepare the customer invoice — complete with suggested retail prices. In this same operation, summary cards (*showing customer and invoice amount*) are punched for use as accounts receivable posting media.

It should be noted that machine processing is not utilized for all lines. The old method is still used on rush phone orders, special and direct orders, and industrial division billings. We do not believe that it is desirable to make all operations conform to the one system which seems best for most of our volume, regardless of the consequences. Hence, less than 5% of our line volume continues to be processed in the special and varied manner found suitable in the past.

RESULTS

Electronic billing, tied directly into the buying function, has revitalized and given a significant *"new look"* to our operations.

We also proved that it was not necessary to upset our organization to conform to the requirements of our data processing equipment. We are gratified that we have been able to develop the new system in such a manner as to dovetail the requirements and long standing practices of our salesman, buyer, clerks, and customers alike — and that very important segment in any operation, top management. In addition, the latter is the beneficiary of much more complete and accurate information on sales, costs, and other data which we can now make available. ■

Profit From Complete Service

You can depend on Wright Line's unmatched, *complete* service. It's an all-inclusive service. Continuous contact by salesmen located throughout the United States and Canada who handle only Wright Line products is an important part. A. A. Croce* of our New York office is shown here calling on Mr. A. Osage, Supervisor of Customer Accounts at Brooklyn Union Gas Company, one of the largest gas companies in the United States. Wright Line salesmen are giving complete service to every account, large or small. Wright Line customers are doing business with a manufacturer of quality equipment. As the originator of data processing accessory equipment, Wright has pioneered 26 years of product development in this field. Again, in 1960, the new catalog 22 has over 30 pages of new equipment to add further efficiencies to your operation. Profit from the experience of salesmen like Al Croce who are selling the only complete service available today.

Catalog 22

Circle No. 14 on Reader Service Card.

THE *Wright* LINE

DATA PROCESSING ACCESSORY EQUIPMENT

THE WRIGHT LINE, INC. / 160 GOLD STAR BLVD. / WORCESTER 6, MASS.
In Canada - THE WRIGHT LINE of CANADA LTD. / DON MILLS TORONTO

**Al Croce was top Wright Line salesman in 1959 and is president of the company 100% Club.*

De Paris on EQUIPMENT —A Regular Feature

JOSEPH R. DE PARIS

A New System

Here is data you should know about the IBM 1401— a new system with broad application possibilities.

THE TRANSITION from the early days of the electronic computer is amazing. Then, as with anything new, the potential user was plagued with fears in deciding whether he could use a computer. Having decided, he was then haunted by doubts that he had come to the right conclusion.

Nowadays, more and more, the question is one of selection rather than of feasibility. Sure, feasibility studies are being conducted and they should be. But generally the question is not *whether* we can use a computer, but rather *which* computer shall we use.

Selection is made all the knottier by the regular appearance of new computer systems on the market. Each new system is more flexible, faster, and more powerful than its predecessors. Generally, they are lower priced in terms of what you get for your hardware dollar. Some have application in limited areas of data processing; others are designed for application over a broad segment of the data processing spectrum.

Independent or Auxiliary System

IBM's 1401 Data Processing System is a new system with broad application possibilities. Here is a system designed to operate independently with punched card equipment or as auxiliary equipment to 7000 or 700 series systems. It is designed on the building block principle with a variety of configurations available to fit the starting and expansion requirements of any user. This is a transistorized system available in two major configurations—card systems and tape systems. There are three basic components in a 1401 system: The 1401 Processor which houses the magnetic core storage unit available in modules of 1400, 2000, or 4000 alpha-numerical characters; the 1402 Card-Read Punch with read speeds up to 800 cards and punch speeds up to 250 cards per minute; the 1403 Printer with printing speeds up to 600 lines per minute. For the tape systems, the 729 Magnetic Tape Units Model II or IV are utilized.

The rental structure ranges from about $2600 per month for a card system consisting of the processing unit, the card read-punch, and the imprinter, to slightly over $10,000 a month for a tape system with all the special devices that are offered.

The 1401 opens the door to electronics for all but the smallest tabulating installations. It must be considered by all users of medium scale equipment because it competes right through the range of the 305 Ramac and 650 of the IBM group as well as with equipment like the Univac Solid State.

At this writing the 1401 seems to have the same mass appeal as the 650 when it was introduced. Certainly the 1401 is receiving widespread attention. Now, in considering a computer system it is necessary to get the facts; the facts are available from the manufacturer's manuals, seminars, and schools. Therefore, perhaps here, we can better direct our attention to a few points which we should recognize in any evaluation of this new computer system.

Storage Capacity

The 1401 is available with a maximum core storage capacity of 4000 alphanumerical characters. On the face of it this compares unfavorably with the 650's capacity of 20,000 or 40,000 characters. But the 650 is a fixed word length machine whereas the 1401 is a variable word length machine. In a fixed word length machine high order positions of words in storage frequently are wasted because the stored field is smaller than the fixed word size. In a variable word length computer, storage positions are required only for significant characters. There is no waste for zeros to the left of significant data.

Furthermore, the 650 command structure utilizes fixed ten-digit instructions for each program step. The 1401 uses variable length instructions ranging from one digit to eight digits.

The obvious conclusion is that fewer storage positions are needed by the 1401 to store a program and to process data. Therefore, the comparison may not be unfavorable at all.

The 1401 is a completely stored program machine. All its functions and directions are controlled by the stored program. No control panels are used. This fact eliminates the need for wiring know-how because the program will accommodate all functions previously done by control panels. Remember, however, that there is a cost in programming and processing time because of the elimination of control panels. Without control panels there can be no format control except by positioning data with programmed instructions.

Unbuffered System

The 1401 is an unbuffered system. This means that processing is inhibited while reading, punching or printing are taking place. For example, reading cards at the rate of 800 per minute takes 75 milliseconds per card. Of this time 21 ms. is Read Start Time, during which the card reader is accelerated and the card

is positioned for reading. Reading the card takes 44 ms., during which no processing can take place. The last 10 ms. are available for processing. If the speed of 800 cpm is to be maintained, another read instruction must be initiated during this 10 ms. portion of a read cycle. The 21 ms. of read start time may also be used for processing, if the read release optional device is secured.

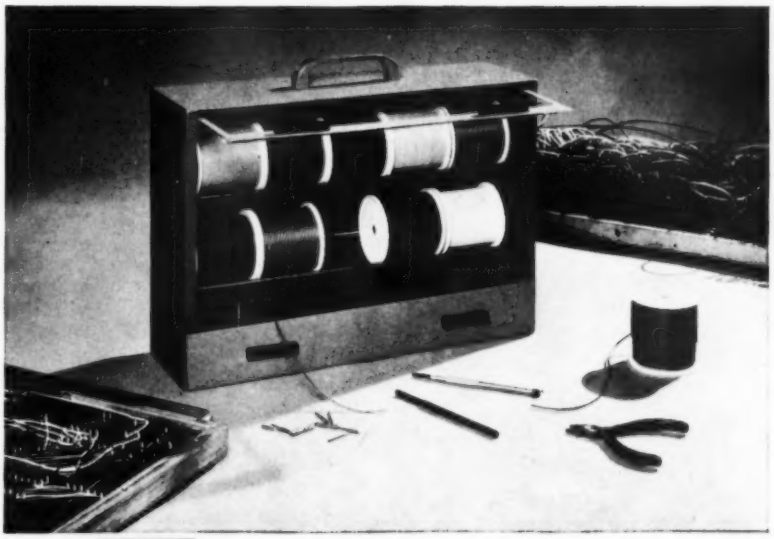
In punching cycles as well, process time is a small part of the cycle. Out of a 240 ms. cycle, 22.5 ms. are available for processing, with an additional 37 ms. of punch start time available if the punch release optional device is used.

The printing cycle takes 100 ms. of which only 16 ms. are available for processing. If the print storage device is used (an optional buffer for the printer), significant increases in output can be achieved. For instance, on a Print and Read combination instruction, the maximum rate of printing and reading can be increased from 400 to 533 per minute. On a Print and Punch instruction, or Print, Read, and Punch, the output is increased from a rate of 200 per minute to 250 per minute.

Careful assessment of your processing requirements is indicated in order to ascertain at what speeds reading, printing, or punching will actually occur. Without buffering, there can be little or no time sharing between components. When the punch is operating the printer and reader cannot be operative; when the printer is operating, the reader and punch cannot be operative.

Offsetting these facts is the great speed of the processing system. Much less time is required by the 1401 for processing than by the 650, for example.

It is predicted here that the 1401 is destined for a prime role in the family of electronic computers. You may expect more and more power to be added to the 1401. Shortly you may hear that 8,000 positions of core storage are available; later on possibly more. Ramac disk files will undoubtedly be added as will additional tape drives. Ultimately, it is the writer's opinion that the 305 and 650 will be superseded, leaving the 1401 in all its configurations as the basic IBM computer system up to the 700-7000 series. ■



GC PANELLOGIC

...an all-new approach to Control Panel Wiring

This GC panelLOGIC kit has been scientifically developed to facilitate your work and lower costs in wiring control panels. It will produce neater panels that are more compact and easier to handle and store. Terminals will be securely affixed, yet readily removable. Circuits will be extremely simple to check and trace.

You know from experience how tangled and bulky a control panel can be when wired by old fashioned methods.

By contrast, panelLOGIC is neat with taut wires that you custom cut to exact lengths. Each card field or machine function can be color coded for easy visual tracing. Wired panels are more compact permitting each rack in the storage cabinet to be used, and eliminating accidental wire removal. 2, 3, 4 or 5 way color-coded split wires can be made in any length. Circuitry checks through terminal posts can be made without removing wires from panel or panel from machines.

You'll find that wiring with panelLOGIC is quick and easy. Once you put panelLOGIC in regular use, we know you'll agree with other users that you'd never go back to the old way of wiring control panels.

SEND FOR FREE BROCHURE!

A new full color brochure describing panelLOGIC tools and materials and showing in detail how to wire panelLOGICLY is yours for the asking. For your FREE copy, send the coupon today!

Manufactured by **CLARKSON PRESS INC.**
A SUBSIDIARY OF
GRAPHIC CONTROLS CORPORATION
BUFFALO 10, N. Y.

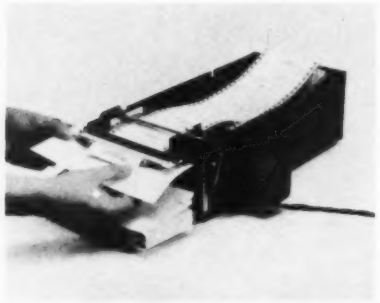
CLARKSON PRESS INC.
194 Van Rensselaer St., Buffalo 10, New York

Please rush my free copy of the GC panelLOGIC brochure titled: "Introducing an all-new approach to Control Panel Wiring".

NAME _____ TITLE _____
Company Name _____
STREET _____
CITY _____ ZONE _____ STATE _____

Circle No. 15 on Reader Service Card.

PRODUCTS & SERVICES



LABEL DISPENSER

Electric Label Dispenser removes pressure-sensitive labels from backing paper. Operator lifts envelope or other form past mouth of machine and label sticks instantly. Dispenser shown accommodates fan-folded flat packs as they come off IDP equipment. Provision is also made for rolls. For further information, contact Allen Hollander Co., 385 Gerard Ave., New York, N. Y.

Circle No. 41 on Reader Service Card.

COMPUTER LANGUAGE

A common Business Oriented Language called COBAL, for use in writing instructions on business-type problems for any digital electronic computer, may soon be available. COBAL, which is written in English and independent of any make or model of computer, was presented in the final report of the Short Range Committee to the Executive Committee of the Conference on Data Systems Languages. This Conference is a voluntary group of computer users from Government and industry, together with computer manufacturers, under whose joint sponsorship the development effort has been conducted.

The Short Range Committee was composed of technical personnel from three Government agencies and seven different computer manufacturers. Working almost continuously since June 1959, this group put together in approximately six months the first business data processing language for programming a wide variety of electronic computers. The Executive Committee now has the report and the language under review and hopes to make an announcement soon concerning the reproduction and distribution of COBAL.

Circle No. 42 on Reader Service Card.

"TRONTAPE"

The Electric Typewriter Division of International Business Machines Corporation announced a new model IBM 632 Electronic Typing Calculator which incorporates five-channel punched paper tape output.

The addition of paper tape output to the 632 will permit the transmission of information over the nation's telegraph wires to a central location for analysis and final report preparation, or for direct input into data processing systems.

The feature will enable five-channel punched paper tape, termed *"Trontape,"* to be created simultaneously as a by-product of the IBM 632 operations.

"Trontape" can be converted to IBM punched cards for processing in accounting machines or data processing systems. A 1,025 foot roll of *"Trontape"* can store as much information as 1,500 fully punched 80 column IBM cards. The new Model IV consists of four units: a modified IBM electric typewriter, a ten-key companion keyboard, an arithmetic unit, and the tape output punch.

Error-free tape preparation is assured by the redundancy check for the five-channel paper tape which verifies the punching of each character and insures that all selected letters and figures have been punched.

Further accuracy is gained by an error deletion device which automatically cancels incorrect information that has been punched into the tape. The error deletion feature operates at a speed of 20 characters per second. Purchase price is $11,900. Rental is $295 per month.

Circle No. 43 on Reader Service Card.

FLIP-FOLD FORMS

A new development in marginal punched tabulating forms has been announced by American Lithofold Corporation. The manufacturer cites five important advantages to these carbonized multiple forms. Since neither deleaving nor disposal of carbon is needed, bursting or tearing costs are eliminated. Fed through a printer with decollator, the Flip-Fold sets emerge separately, ready for binding.

All parts of the Flip-Fold continuous multiple forms are made from carbonized paper, except the last. Flip-Fold folding keeps all carbon surfaces concealed and carbon never touches the user's hands. Designed especially for use where finished work can remain in continuous strips, these forms permit full view of two pages at a time.

Circle No. 44 on Reader Service Card.

ROTARY FILES

A new series of "Lazy Susan" rotary files has been announced by Acme Visible Records, Inc. With these files, which turn at the touch of a button, it is possible to have up to 250,000 record or data files available in seconds to any of one to twelve users seated at desks around the circumference. Diameters range from 40" for desk top models to 77½" for big power files. From one to six reference tiers are available.

Circle No. 45 on Reader Service Card.

LABEL PRINTER

The *Model 910 Videograph Label Printer* (A. B. Dick Company) is designed to accept six channel parallel digitally coded information at a constant rate and in edited form, that is, information organized in the sequence in which it is to be printed, and provided with codes representing the various printing functions. It may be employed as an output printer directly from a digital computer in which the coded information is edited and produced at a constant rate acceptable to the printer, or a buffer storage system may be provided to permit driving the printer from un-edited file information.

Circle No. 46 on Reader Service Card.

PRINTAPUNCH

A system of creating machine language source data at point of use has been embodied in a business machine which, using embossed plastic or metal plates, punches pre-scored

IBM cards. The machine, developed by Dashew Business Machines, Inc. under license from IBM, incorporates the IBM Portapunch for the direct card punching. Legible, imprinted data is created simultaneously through the use of embossed plates.

The Printapunch is being produced specifically to meet the needs for capturing source data at the point of origin. This eliminates the writing and separate punching of source documents — duplicate steps which are needed for integrated data processing systems. The Printapunch reduces data processing costs by eliminating key punching of source data, and eliminates errors now introduced into the data processing systems from transposition of manually punched data.

Plastic or metal plates, containing embossed data in one field and punched data in another, are directly responsible for the high speed operation of the Printapunch. The embossed cards are identical in size and weight with current plastic credit cards. The only difference lies in a series of round holes punched in an otherwise unused area. In the machine, these holes act as punching templates. Code holes in the plastic cards are created automatically as part of a standard Dashew embossing machine operation. The punching is done on either of two embossing machines now marketed by Dashew—the V100EW Electronic Databosser or the 410 Electronic Datatyper. Information incorporated in the embossed plates can vary widely according to individual application, however, in every case the system requires the use of IBM Portapunch cards. Using these two components, plus an optional fixed plate for repetitive data which can be locked into the unit, various operations can be performed on a form set incorporating an IBM card.

Depending on quantities desired, price tags are as low as $75. Deliveries are scheduled to begin in April, 1960.

Circle No. 47 on Reader Service Card.

CODEWRITER

The Royal McBee Codewriter is a group of electronic data input and output machines. The units print characters serially and provide man-machine coupling to data processing and data handling equipment. The *input* unit allows variable data entry and record creation for computer data processing, creation of media for automatic control device input and other applications. The *output* unit creates a permanent record of complete or exception data.

Circle No. 48 on Reader Service Card.

DIRECT ACCESS

Card input and output equipment, as well as printers, can now be supplied *directly* as integral parts of its 205 and 220 electronic data processing systems, it was announced by the ElectroData Division of Burroughs Corporation.

The equipment is especially designed for use in Burroughs Cardatron sub-systems which provide any combination of input to and outputs from the computer up to a total of seven. The editing and format control facilities of the Cardatron are extended by control panels in each unit. The new computer components, to be available for delivery in November 1960, are:

Card Input Unit — This unit reads at the rate of 300 cards per minute and is equipped with a single control panel which extends the editing and format control facilities of the 205 and 220 Cardatron systems. Using standard cards, the unit has a hopper capacity of 1,000 cards. With manual adjustments the unit will accommodate cards of postcard thickness. Purchase price is $14,000. Lease, $300 a month.

Card Output Unit — The unit operates at 100 cards per minute, either reading or punching. It can also be used for gang-punching of specified columns. Features include eight movable brushes at the pre-punch reading station, and a post-punch reading station with 80 brushes. As optional equipment, the user may obtain double-punch blank column detection for 80 columns and an offset stacker. The card output unit will sell for $5,800, and lease for $150 monthly.

Line Printer — The line printer operates at 150 lines per minute. The 120 print positions each include alphabetic, numeric and 13 special characters. Plain or punched forms, up to 22″ long and 20″ wide, are accommodated by the printer carriage with vertical spacing adjustment to either six or eight lines to the inch. The carriage is controlled by a paper tape loop. Six skipping channels, one overflow channel, and one, two, or three-line spacing are available. Purchase price of the Burroughs line printer is $36,000. It will lease for $850 per month.

Circle No. 49 on Reader Service Card.

READATRON

A low cost credit card imprinter for use with credit plans which employ embossed or debossed cards has been developed by the National Data Processing Corporation. The Readatron is capable of imprinting invoices suitable for automatic reading. In quantities of 1000 the units sell for $21 each. The M-103 Recorder is, according to the manufacturer, sturdy but simple in construction and easy to operate. Models are available for use with any size punched card or plain paper invoice sets.

Circle No. 50 on Reader Service Card.

DATA PROCESSING UNIT

A record of animal behavior under experimental conditions is condensed and analyzed under the direction of a control panel by the DYKOR processing unit. This equipment, together with the acquisition unit, constitutes the Data Acquisition and Reduction System for the psychological experimental laboratory of a large pharmaceutical firm.

One of two magnetic tape handlers reads the record of events for a single animal or cage at a time as recorded on a given channel of the tape. While one handler is rewinding, the second is reading, so that the equipment is functioning con-

(continued on next page)

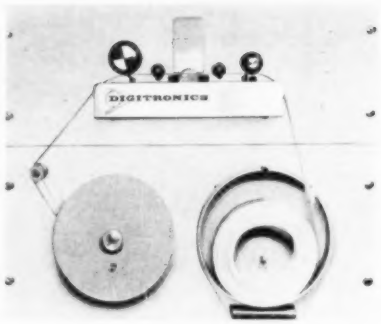
tinuously. As the data is read it is abstracted and analyzed according to the arrangement of a control panel and the resulting information is punched out on cards. Switch settings can be arranged to delete punchout of data which is non-significant. Provision is also available for manually setting up identification data via switches and the control panel which will be punched out on the cards with the corresponding data. If examination of the cards warrants further analysis, the originally recorded data is not destroyed. Additional analysis in greater depth can therefore be made by rereading the desired channel with a new control panel arrangement. Digitronics Corporation, Albertson, L. I., N. Y.

Circle No. 51 on Reader Service Card.

DESK TOP STENCIL DISPENSER

The Model "200" desk top dispenser manufactured by Weber Marking Systems, Inc. is designed to make tabbing on invoice forms quicker and easier. Only the pressing of a lever is required to get the "Tab-On" stencil ready to go on single set or continuous forms. The inconvenience of opening packages or removing backing paper is eliminated. After tabbing, forms and stencils can be prepared with customer's address simultaneously on any typewriter or other data processing equipment.

Circle No. 52 on Reader Service Card.



SPOOLER HANDLES 300 FEET OF TAPE

Model 4533 DYKOR Spooler unit provides a take up reel for a minimum of 300 feet of punched paper or Mylar tape. The six inch diameter reel unit can be used with standard DYKOR photoelectric readers for operating speeds up to 300 characters per second if fast stop requirements are to be met.

In addition to the take up reel, there is a feed bin. Together they maintain the simple loading and unloading of tape. The unit mounts on standard 19" relay racks directly beneath the reader and requires 8¾" of panel.

Circle No. 53 on Reader Service Card.

ADDRESSING MACHINE

The Model 10-S Addressing Machine manufactured by Scriptomatic, Inc. is designed with an electronic sensing feature which allows the machine to "read" information punched on card masters, which can also be cards for IBM, Remington Rand or other punched card systems. Speed and simplicity are emphasized. No hand levers or foot pedals are needed, nor belt conveying mechanisms. Switching from automatic feeder to hand feed takes less than a minute.

Circle No. 54 on Reader Service Card.

BI-DIRECTIONAL PAPER-TO-MAGNETIC TAPE CONVERTER

The DYKOR Model D104 bi-directional Tape Converter speeds up the flow of data between remote stations and a central computer installation. In one mode this transistorized unit converts information directly from punched paper tape produced by teletype transceivers to magnetic tape in parallel 7-bit alpha-numeric code. In the other mode, data on magnetic tape produced by the computer are converted directly to their corresponding form on teletype paper tape.

Paper tape data are introduced into the converter by a DYKOR photoelectric reader at 300 characters per second. Magnetic tape is read or prepared in a form compatible with the computer it is to feed.

In addition to editing capabilities, the converter can be made to recognize the distinction between legitimate data and items in non-standard format. Examples of the latter, which are deleted from the translation to magnetic tape, are typing errors caught by the operator and X'd out, correction messages explaining errors in previously transmitted records, and sign off messages after completion of record transmission. Distinctions between types of records can be made and, depending on the record, spaces of other preselected characters are emitted on to the magnetic tape. After manual initiation the translation proceeds auto-

matically until the end of input tape data.

Paper tape output is prepared by a high-speed perforator punching at a rate of 2400 words per minute in standard teletype five-level code. Although the input and output data are in different codes they are identical in content except for editing and format control characters appearing on the output tape. These characters, including figure and letter shifts, spaces, carriage returns and line feeds are inserted or deleted in part automatically, in part under the direction of a control panel. The data thus inserted permit complete control of the remote teletype printer without special computer programming.

The control panel program has several other control features available. Whereas controlled reading of magnetic tape requires that data be organized into blocks, the output blocks on paper tape may be continuous or program separated by either the computer or the D104 control panel program. The facility for translating characters in different ways, depending on character position, is also included.

Circle No. 55 on Reader Service Card.

RW ANALYSIS CONSOLE

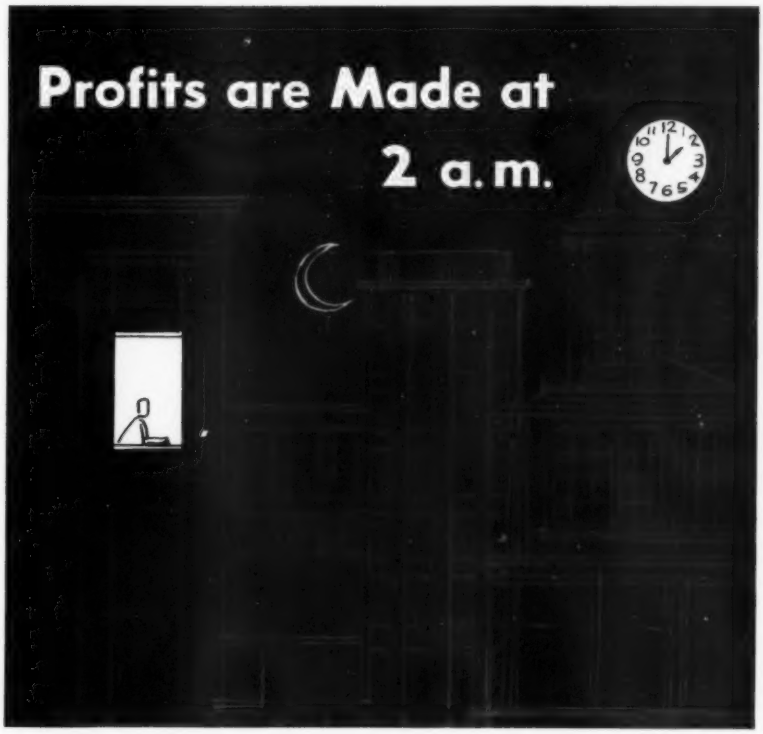
This control and display console makes it possible for anyone to operate a computer and interprets data in non-technical language. It can be connected to any data processing system. Through the use of a simple keyboard arrangement, operators may control the computer and demand a display of data, either in graphic or in understandable printed form on the console's video screens. Therefore the individual need not be familiar with the technical computer code since he can search the computer, and receive the answer, in his own language. Suggested applications for the console, introduced by the Ramo-Wooldridge Laboratories Division of Thompson Ramo Wooldridge Inc., are banking loans, weather forecasting, inventory control, market analysis, sales forecasting and production scheduling.

Circle No. 56 on Reader Service Card.

BURSTER ATTACHMENTS

Three attachments to the Egry Divi Burster have been introduced

(continued on next page)



The City sleeps, but this business goes on as usual, with the help of Baltimore Business Forms. Day and night customers phone their orders to central headquarters. Robot machines, in branch delivery offices, print orders simultaneously on troublefree Therm-O-Seal Handy-Fast Forms, recommended by the Baltimore Business Forms Systems Advisor. When morning comes . . . nighttime orders are completely written . . . ready for delivery without delay. The profits have been made . . . while the city sleeps.

Write or phone the Baltimore Business Forms Company for the interesting report . . . "A Robot Writes." Perhaps some of these money-making methods may be adapted to your own business.

Circle No. 16 on Reader Service Card.

Baltimore Business Forms

Division of the Baltimore Salesbook Company

3128 FREDERICK AVENUE, BALTIMORE 29, MARYLAND

by The Egry Register Company, Dayton, Ohio.

The attachments are an imprinter, punched card burster and the Verti-Liner, an Egry development which adds vertical lines to continuous forms as they are being separated and trimmed on the burster.

The imprinting attachment adds signatures to checks or other information to continuous forms going through the burster at the rate of 25,000 per hour. Removable rubber plates and a special quick-drying ink are used. The imprinter has pinwheel registration for accuracy. To convert the Divi Burster for use with continuous punched card forms, the operator merely adds the punched card attachment. This unit handles any width punched card, including double width, at speeds up to 30,000 per hour. It removes the binding chip and marginal strip from the cards.

Circle No. 57 on Reader Service Card.

DATA PREPARATION

Comptometer Corporation of Chicago has introduced a new *Compto-Card* data preparation system which combines calculating and key punching into a single operation. This new equipment eliminates an entire operation by producing punched cards as a by-product of required calculations. Used in conjunction with an IBM key punch, it is small enough for desk-top use.

Also available is *ComptoTape*, which offers the advantages of ComptoCard but is designed for use with punched tape systems. The firm's new solenoid operated two-total adding machine may be used with ComptoTape to provide both printed proof of prepared data and an accumulation of pertinent information. The adding machine, which operates at speeds in excess of 20 impulses per second, can also be used with other business machines, or manually.

Circle No. 58 on Reader Service Card.

"COLLECTADATA"

Friden, Inc. has introduced a new system, composed of readers and punches, which collects data from several points of origin and channels it to a central processing point. The system may accumulate daily up to the minute records of each factory job, from start of work to shipping, and then transmit this data to the main office for data processing.

The input document (punched card, tape, edge punched card, or form card) can be coded by combinations of punched holes to designate order number, part number and quantity. This form accompanies a production order through each step of the manufacturing process. As work is started or completed, a card or tape with coded information describing the job is inserted into a Collectadata transmitter which automatically reads it. Numeric information can also be transmitted by means of manually controlled dials.

All variable and constant input is then channeled by cable to a data collecting center where it is reproduced on a receiver into a continuous punched tape. This tape can be fed to a computer, a tape-to-card converter or a Friden Flexowriter to prepare various documents used for reporting functions, such as job priorities, anticipated shortages, backlogs, and scheduling. The information may be used also for production time recording; the receiver can be connected to a time code emitter which will read out a time indication automatically with each transmission.

Circle No. 59 on Reader Service Card ■

New

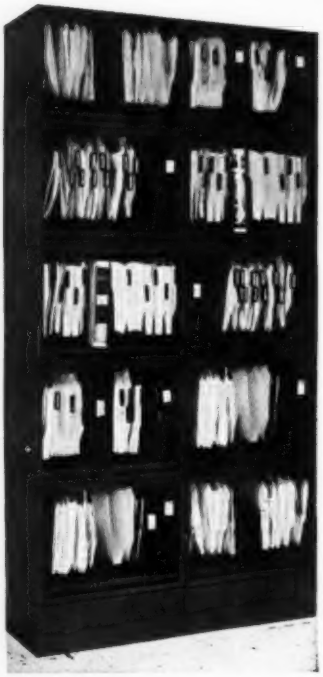
TRACT-A-FILE Jr.

Conquers

FILING SPACE PROBLEMS

- CATALOGS
- DATA PROCESSING MANUALS & WRITE-UPS
- TELEPHONE DIRECTORIES
- LETTER FILES

... All kept handy to point of use



Reference data always at hand.

• Highly adaptable TRACT-A-FILE JR. stacks anywhere 2-to-5 high. Only domestic shelving unit with "home" (hanging-type) folders and moveable followers to provide for all-purpose filing. Dimensions—Outer: 20" wide, 14¼" high, 12¾" deep. Inner: 18½x12½x12¼.

•

For your copy of new TRACT-A-FILE JR. Bulletin TFJ-160, write or call *TODAY*.

Circle No. 17 on Reader Service Card.

PRODUCT OF Ramsey COMPANY • 116 So. SEVENTH STREET PHILA. 6, PA. (MArket 7-0879)

–A Monthly Feature **Marien on FORMS**

The Bigger They Come– The Better We Like It!!

Now that the Fabulous Fifties have ended and we can look back on it as a decade of great change in both our social and business lives, there is one particular metamorphosis that is very significant to the forms man. For it was during the Nineteen Fifties that forms printing experienced its greatest period of change.

Prior to that time *everybody* printed forms, whether they were actual printers or mere amateurs. Moss-laden cellar dwellers with one mimeo or ditto machine were cranking out masterpieces of foolishness that they called *"forms."* Job printers of every description, using clanking "clamshell" presses capable of 500 to 600 copies an hour were pounding out handfed forms while trying not to lose their fingers in the process. Others, with a little better equipment of the flat bed cylinder type were spending large sums of money on costly printing plates and passing this on to the consumer. Rag paper was common for forms printing.

Only the *"really big"* printers with rotary, web-fed presses were making forms that epitomized economy and utility combined. Too much of private industry's hard earned cash vanished into the wasteful area of "schlock" printing.

A *"schlock" (junk)* printer would *"shoot"* copy, rather than recompose it. If he did buy any composition, it was horrendously designed. Oddly enough, the money these *"junk shop"* printers spent for equipment could have been used more wisely for small offset equipment which would have enabled them to give better service and neater looking forms *at less money!* Most of them fought it, instead of welcoming it.

The big printers however, recognizing the signs of revolution, swung into lithography as rapidly as possible. And for them, it was a *costly* process because they were not replacing small presses.

While much rotary forms printing is still being done by rubber-plate letterpress today, the better printers are converting to lithography as fast as economics permit. The *"quality"* jobs are always done litho. Sharper ruled lines, and greater use of halftone screens for phantoms and tinted areas are but two of the reasons. The big customers, with knowledgeable forms buyers, demand the best in their printed forms and, if the quantity permits, rotary litho satisfies that need.

We should add that advances in rubber plate printing technology have made that process highly acceptable as well. Many jobs printed by rubber plate are pretty close to offset in appearance. At least to the average observer or user of business forms. Yet, they cannot quite come up to litho in the two areas mentioned above.

Web-fed printing, easily the most economical if the run is large enough, has been a big factor in the high quality of forms printing produced by the large printers around the country. Registration is held to close tolerances. A great variety of stocks can be fed rapidly through the presses from large rolls of paper without worrying about misfeeding or jam-ups or slow-downs to any great degree.

In a large sense it would be impossible for data processing equipment to have reached its present state of development had it not been for these big printers. Someone had to develop the forms to stand up under the rigors of high speed operation. Someone had to research the problems of multipart printing with ultra-thin carbons and super-calendared paper that would not tear and jam up the data processing equipment. Of what use is a high-speed printer that can bat out a thousand lines a minute, if no one had been able to produce a business form that would survive such a hazardous journey? In a way, it was the *"Murmansk Run"* of forms processing, and the big printers met it and came through. It is not generally known, but the technical skill of these printers was and *is* used every day by data processing equipment makers, in testing and researching acceptable forms combinations for their machines.

Today, when these giants of the forms printing field walk out of our companies with the big orders for specialty printing, no one seriously questions it. They *know* what is expected of them, they *know* their forms will produce under the most trying conditions, and they have one other ace up their sleeves. Because of their large scale operations, their prices are usually low. That's why we repeat—*"The bigger they come—the better we like it!"* ■

PEOPLE AND PLACES

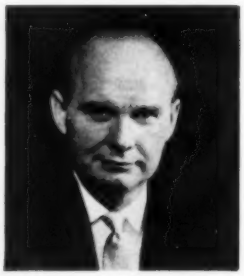
IBM DIVISIONAL PRESIDENTS

Thomas J. Watson, Jr., president of International Business Machines Corporation, announced the promotion of four of the company's divisional general managers to the new position of divisional president. They are:

CHARLES BENTON, Jr., Federal Systems Division. This division serves the data processing requirements of the military and all federal government agencies.

GILBERT E. JONES, Data Processing Division. This division leases, sells and services the complete line of IBM punched card accounting machines and electronic data processing systems for all domestic markets except the federal government.

WILLIAM B. McWHIRTER, Data Systems Division. The division develops and manufactures large-scale electronic data processing systems.



ORLAND M. SCOTT, General Products Division. This division develops and manufactures intermediate and small computing systems and punched card accounting machines.

PHILCO SYSTEMS MANAGER

WILLIAM N. LUCKE, former Lt. Colonel, U. S. Army Corps of Engineers, has joined Philco Corporation's Government and Industrial division as Systems Manager with responsibility for the planning and development of electronic data communications, display and processing systems. Prior to his retirement upon 20 years of active duty as a regular army officer, he served as Director of the Engineering Data Processing Center, Office of the Chief of Engineers, Washington, D. C.

STANDARD REGISTER ADVERTISING AND PUBLIC RELATIONS

MERRILL F. HYER, ROBERT S. PARKER and ROY G. LJUNGREN have been named to new positions in the Advertising and Public Relations Division of The Standard Register Company.

Mr. Hyer, formerly director of sales promotion, becomes assistant director, advertising and public relations. Mr. Parker has been named advertising manager to succeed J. E. Romig, who retired from active service on December 31, 1959. Mr. Ljungren, new sales planning manager, joined the company in 1956 as a staff assistant in the advertising and sales promotion department.

RCA VICE PRESIDENT

Appointment of LEONARD S. HOLSTAD as Vice President, Electronic Data Processing Service, RCA Service Company, was announced by Donald H. Kunsman, President.

Mr. Holstad will be in charge of a new activity within the RCA Service Company to install and service RCA's 501 Electronic Data Processing Equipment. He will report to G. W. Pfister, Vice President, Commercial Services.

BENSON-LEHNER MANAGER

H. J. Rounds, Jr., Executive Vice President of the Benson-Lehner Corporation, Santa Monica, California, has announced the appointment of

ROBERT C. SAUNDERS, JR. as Manager of Applications Engineering. With Mr. Saunders' appointment, applications engineering responsibility has been enlarged to include all corporate marketing functions.

Mr. Saunders is active in the Instrument Society of America, having served for the past two years as National Director of the Data Handling and Computation Division.

NEW DIVISION

The missile section of Bendix Aviation which manufactures the Navy's Talos missile, has been established as a separate division of the corporation. The newly designated Bendix Mishawaka division formerly operated as part of the Bendix Products division in South Bend.

ARTHUR C. OMBERG, Bendix general manager at Mishawaka, has been named an assistant group executive to supervise the new division as well as the Hamilton division of Bendix at Hamilton, Ohio.

BURROUGHS' STAFF OFFICES

In a marketing organizational improvement program, Burroughs Di-

vision, Burroughs Corporation's largest operating division, created two new staff offices. PAUL G. KANOLD is manager of marketing economics and THOMAS J. COE is manager of marketing personnel. Both offices will report directly to Noel L. Mudd, general manager—marketing, Burroughs Division.

Kanold heads up the economics group to provide better coordination in forecasting, product pricing, inventory planning, production requirements and budgets.

Coe is charged with directing personnel policies, programs and procedures, including coordination of all field communications dealing with marketing policy and administration.

BENDIX TOP POSITIONS

GEORGE E. STOLL and A. P. FONTAINE have been elected executive vice presidents of the Bendix Aviation Corporation, it was announced by Malcolm P. Ferguson, president. Both men are directors of the corporation and members of its administration committee. They served previously as vice-presidents and group executives.

Stoll will be responsible for the direction of 24 U. S. divisions and subsidiaries. He plans to move his headquarters from South Bend, Indiana to Detroit.

Fontaine will be responsible for many staff functions, including engineering and research, sales, planning, product development, and patent activities. His office is in Detroit.

CORPORATE CONTROLLER

HARRY G. BOWLES, a veteran of 30 years' service in executive, financial and administrative positions within Burroughs Corporation, has been elected controller of the Corporation by the Board of Directors, announced Ray R. Eppert, president. He will report to K. C. Tiffany, vice president of finance.

GENERAL ELECTRIC MANAGERS

Three top managerial appointments in the General Electric Company's Computer Department were announced by Clair C. Lasher, general manager of the department. They are:

KENNETH R. GEISER, former manager of engineering, named manager of the Department's newly-organized business-planning operation;

Dr. ROBERT R. JOHNSON, former manager of the Department's Computer Laboratory at Palo Alto, Calif., named manager of engineering;

Dr. HELMUT M. SASSENFELD, former manager of operations for the Department's Huntsville, Ala. Computer Center, appointed manager of the newly-formed applications section.

The Computer Department develops, designs and manufactures a complete line of business, scientific and process control computers.

Two key sales appointments in the Computer Department were announced by L. R. Sheeley, Department manager of sales. They are:

DuPUY F. CAYCE, to the newly-established position of sales manager for advanced data processing systems; and

WARREN F. PRINCE, to succeed Mr. Cayce as sales manager for business data processing equipment.

AERONUTRONICS MANAGEMENT

Appointment of A. CLYDE FLACKBERT as manager of Administration for Tactical Weapon Systems Operations at Aeronutronic, a Division of Ford Motor Company, was announced by Roy P. Jackson, general operations manager.

Prior to joining Aeronutronic, Flackbert was one of three managers at the Airborne Instruments Laboratory Division of Cutler-Hammer with joint engineering management responsibility for a $40 million U. S. Air Force reconnaissance system team contract.

STEIG GAVELIN's appointment as manager, Market Planning and Analysis Department, Product Planning was announced by Dr. S. Dean Wanlass, manager of Product Planning. He was formerly western representative for Aeronutronic, a position he had held since joining the Newport Beach firm in early 1959. Before that he was with Minneapolis-Honeywell Regulator Company as marketing manager in the Military Products Group.

(continued on next page)

Circle No. 18 on Reader Service Card.

Pro-Forms are **procedure forms**, designed to provide instructions to operators of IBM data processing machines in a **very simple** manner. **Pro-Forms** insure that the procedure-writer or IBM supervisor will write instructions **not** so that the operator will understand but rather so that **the operator cannot possibly misunderstand.**

We have a **big, four-page, easy-to-read, illustrated** brochure about **Pro-Forms** which, together with some sample forms, we will be happy to send to you — without obligation on your part. **Please ask for it.** Then you'll know why, every day, more and more large and small organizations all the way from Honolulu, Hawaii, to Haifa, Israel are changing to **Pro-Forms.**

You can have a complete **Pro-Forms system** (thousands of forms, procedure-covers, ball-point pen, check-mark stamp, stamp pad, steel indexed forms-holder, and a 40-page **illustrated** instruction-manual) for about the cost of one tabulator control panel. **Pro-Forms are priceless.** They pay for themselves, again and again. May we send you our **Pro-Forms** brochure?

NEW YORK CITY (and environs)
Call WO 6-1454
Carteret Printing Co.
480 Canal Street

SAN FRANCISCO (and No. Calif.)
Call DO 2-5031
The T. A. Moran Co.
420 Market Street

MIAMI (and Southern Florida)
Call PL 7-1669
A B C Business Forms
777 N. W. 54th Street

SALT LAKE CITY (and region)
Call HU 6-8711
The Eric J. Seaich Co.
1031 East 21st South St.

BOSTON (and New England)
Call DE 2-5971
Certified Business Forms, Inc.
1294 Washington, W. Newton 65

The
Pro-Forms
Company
P. O. Box 715
San Francisco 1, Calif.

OTHER CHOICE PRO-FORMS DISTRIBUTORSHIPS in UNITED STATES and CANADA
still available to qualified, established sales organizations. Ask about this generous proposition.

MAJOR BENDIX POSTS

Three major executive appointments on the staff of the Bendix Aviation Corporation and its Systems division have been announced by Malcolm P. Ferguson, Bendix president. Dr. RUSSELL D. O'NEAL, formerly general manager of the Bendix Systems division at Ann Arbor, Michigan, has been elected vice president in charge of engineering for the corporation; ROY J. SANDSTROM, formerly assistant general manager of the Systems division, was appointed general manager; and L. B. YOUNG, who has been in charge of long-range planning for the division, was named assistant general manager.

Dr. O'Neal, in addition to his engineering responsibilities, also will have two divisions—the Bendix Systems division, and the Research Laboratories division in Detroit — reporting to him.

Sandstrom, who helped to develop and direct several of the nation's major aeronautical projects—including the Bell X-2 that reached a speed of 2,160 miles an hour and an altitude of 126,000 feet—joined Bendix in 1959. Formerly he was vice-president in charge of engineering for the Bell Aircraft Corporation.

Young joined the systems planning group of Bendix in 1955, and has been responsible for systems analysis in such areas as infra-red and radar surveillance, ballistic missiles, air defense, data processing, countermeasures, communications, air traffic control, antiaircraft weapons, and task force defense.

SPECIAL ASSISTANT

International Business Machines Corporation announced the appointment of J. J. KENNEY, vice president, as a special assistant to the president of the company. Mr. Kenney previously was director of service on the corporate staff. He is succeeded in that position by J. CLINTON ABRAMS, former assistant director of service. IBM service groups are responsible for the installation and maintenance of IBM equipment.

PHILCO DIRECTOR

The appointment of GEORGE V. WOODROW, JR. as director of weapons systems engineering for Philco Corporation's Government and Industrial Group, was announced by Henry F. Argento, vice president and general manager of the Group. Mr. Woodrow was formerly associated with the Bendix Aviation Corporation where he served as Chief Engineer for Research and Development.

DIRECTOR FOR UNIVERSITY RELATIONS

Dr. ALBERT A. CANFIELD has been appointed director of university and scientific relations for the Bendix Aviation Corporation.

Dr. Canfield, who has been associate professor of management in the school of business administration at Wayne State University in Detroit, will coordinate the activities of 25 Bendix divisions in the placement program for engineering and scientific personnel. In addition, he will administer Bendix's scholarship and fellowship program with 29 major colleges and universities in the U. S. His duties also will include the development and maintenance of contacts with engineering and professional associations, assistance to educational institutions in the placement of materials to be used in technical and scientific training, and research activities.

40-YEAR MAN

After 40 years of service to Burroughs Corporation, CLARENCE DUNLOP, vice president - manufacturing facilities planning, has retired. Mr. Dunlop was appointed vice president in 1952 in London, England, after three years as manufacturing consultant abroad. In 1919, following service in the U. S. Navy during World War I, and a brief period thereafter with the Cadillac Motor Car Co., Mr. Dunlop joined Burroughs Corporation as a tool maker. Between 1919 and 1941 he served in various capacities in the company.

■ ■ ■

OUTPUTS

ITEMS OF INTEREST FROM HERE AND THERE

PHILCO COMPUTER DIVISION

The formation of a separate Computer Division by the Government and Industrial Group of Philco Corporation to handle the company's increasing business is this field was announced by Henry F. Argento, vice-president and general manager of the group. Headquarters for the new division will be in the company's recently completed computer plant near Willow Grove, Pa. Division personnel are now moving into the 200,000 square foot facility which will house a 1,200-man management, research and manufacture group. The plant will permit Philco to increase both production and research in advanced computer developments. Herman A. Affel Jr., formerly director of computer engineering, will be general manager of the division.

BURROUGHS REORGANIZATION

A major re-organization of Burroughs Corporation to capitalize on the increasing demand for mechanical, electro-mechanical and electronic data processing equipments and systems has been announced by Ray R. Eppert, president. The changes, which go into effect March 1, include the merging and re-alignment of many staff and line activities in manufacturing and engineering, and in marketing. Burroughs Division and ElectroData Division will be discontinued as organizational units. Both of these divisions have had their own manufacturing plants and their own marketing organizations. In the reorganized structure, their sales and service has been separated from manufacturing and engineering facilities. Burroughs Division has been responsible for manufacturing and marketing of mechanical and electro-mechanical equipment and recently has extended its activities into electronics. ElectroData has produced and marketed electronic computers and data processing systems for scientific, industrial and commercial purposes. The marketing activities of these divisions will be joined in a new division to be known as Equipment and Systems Marketing. Product Planning will be re-organized into an integrated, corporate-wide operation under M. E. Mengel, who will continue as vice-president — product planning. There will be no changes in the present organization of the International Division, Defense Contracts Organization and the Corporate Finance Activity. ■

"I'VE GOT A PROBLEM"

(with Advice from the OLD TIMER)

Dear Old Timer:

There is a need for consolidation and digesting of the large volumes of information now being published in the data processing field. I would be interested in knowing if such a thing exists.

A California Reader

Comments:

At least one good digest and several good reporting services are available. Data Processing Digest, 1140 S. Robertson Boulevard, Los Angeles 35, California, $24.00 per year, does an excellent job of abstracting the activities in the computer field. Some original material is also presented in DPD. Automatic Data Processing Newsletter published twice a month by John Diebold & Associates, Inc., 40 Wall Street, New York 5, New York, $37.50 per year, gives insight into new developments and existing conditions, primarily in the computer field. Office Automation News Bulletin, published by Automation Consultants, Inc., 155 Fifth Avenue, New York 10, New York, $37.50 per year, is a monthly report on developments in the computer field. Systemation is a semi-monthly letter on systems, trends and techniques; $20 for 24 issues, Ross-Martin Company, Box 800, Tulsa, Oklahoma. The 1960 Volume (No. Two) of The Punched Card Annual will include a comprehensive biographical index to data processing articles published in all periodicals including those in the general management fields.

Dear Old Timer:

I would be interested in a complete listing of tabulating supervisors and companies for correspondence purposes relating to individual problems. Do you know of any such sources?

Comments:

A directory of "Tabulating and Data Processing Installations" is published on a local basis for the forty largest cities in the U. S. Only a few cities are currently available — the balance are scheduled for distribution during 1960. You may obtain only the section for the city in which you are employed. For information write Menzies and Son Publishing Co., Inc., P. O. Box 780, Houston 1, Texas.

A very comprehensive directory of punched card equipment users appeared in Volume Three of The Punched Card Annual (1955) *including 1500 individuals in the U. S. and Canada who agreed to participate in idea-exchange correspondence. It is indexed in great detail by application function and type of business. A very few copies remain at $10.50—956 Maccabees Bldg., Detroit 2, Mich.*

Dear Old Timer:

It would be most helpful if a Manual was published setting forth types of computer equipment that are available from leading manufacturers, indicating the prominent characteristics, advantages and disadvantages of each. Please tell me of the sources with which you are familiar.

Comments:

Several reference sources are available on this. The Computer Guide section of the new Punched Card Data Processing Annual *($15.00, 956 Maccabees Bldg., Detroit 2, Mich.) is a good basic reference and also contains a computer comparison chart.* Business Electronics Reference Guide *(non-members $15.00) goes into great detail on all equipment available up to date 1957. Controllers Institute, 2 Park Ave., New York 16, N. Y.* Office Automation Handbook *($37.50) is a looseleaf presentation that can be kept up to date by also subscribing to the updating service for an added $37.50 per year. 155 Fifth Ave., New York 10, N. Y.*

Dear Old Timer:

Communication between like industries is practically non-existent. It is difficult to get information on who is doing what and to thrash out mutual problems. I would like to see small groups organized in like industries to aid in this cause. What do you say?

Comments:

There is some intra-industry association activity but there should be more. The Insurance Accounting and Statistical Association (P. O. Box 139, Kansas City, Mo.) and Railway Systems and Procedures Association (433 Grand Central Station, Chicago 7, Ill.) are examples.

How about some of you pioneering in your industry? It's hard work but highly satisfying. We'll help you get started if we can. Or write to the existing groups to benefit by their experience. ■

CLASSIFIED AD

CONTINUOUS FORMS

Send for Samples our exclusive
Handy TAB Electronic Pasted Forms — no staples.

BALTIMORE BUSINESS FORMS CO.
540 N. Michigan Ave., Chicago 11, Ill.

DATA . . . it's yours for the asking!

For your convenience in obtaining pertinent and helpful information on the latest equipment, forms, services and related products in the data processing field, we direct your attention to the following free literature available from the manufacturers. Circle the numbers pertaining to the literature you wish to receive on the Reader Service Card appearing elsewhere in "DP."

A STOCK FORMS CATALOG AND INVENTORY BOOK has been published by UARCO Incorporated, designers and manufacturers of business forms and forms handling equipment. The book contains illustrations of all methods of fastening and rulings available on stock control punched forms; a detailed list of stock control punched forms that can be shipped immediately after receipt of orders; and a description of binders suitable for storing burst and unburst forms. The remainder of the book contains inventory pages to be used in keeping records of control punched form supplies and order information.

Circle No. 70 on Reader Service Card.

Model 900 VIDEOGRAPH PRINTER (A. B. Dick Co.) is a high speed page printer designed to produce alphanumeric information in sheet form from six-channel parallel binary input signals. Its principal application is as an "on" or "off" line printer from systems employing high-volume digital computers. Booklet details information.

Circle No. 71 on Reader Service Card.

Model 905 VIDEOGRAPH PRINTER (A. B. Dick Co.) is a high-speed page printer for producing facsimile copies of graphic source material at rates up to three sheets per second. The equipment is especially adapted to be driven by and controlled from a source of video and pulse-coded electrical signals representing input information, such as the Model 920 Videograph Scanning Unit. Descriptive data is available.

Circle No. 72 on Reader Service Card.

Model 920 VIDEOGRAPH SCANNING UNIT (A. B. Dick Co.) converts graphic source material in sheet form into video and electrical pulse signals adapted to drive and synchronize a high-speed output equipment such as the Model 905 Videograph Printer, to produce high-resolution copies of the graphic source material at basic rates of up to three 8½" x 14" copies per second. While it is available as a precision-built mechanical-optical equipment for converting graphic source material into electrical signals for general communications and facsimile reproducing purposes, it has been specifically designed and developed for use in connection with equipment embodying the Videograph Process for converting signals as produced from the scanner into printed hard-copy at high speeds.

Circle No. 73 on Reader Service Card.

CONTROL PANEL CABINET of Tab Products Co. is a new model cabinet which accommodates 16 flexibly wired or 20 permanently wired double control panels. Although this cabinet is specifically designed for double panels, it is adaptable to several sizes and for general data processing room storage. Leaflet describing cabinets and 100-page Catalog 10 of data processing auxiliary equipment are available.

Circle No. 74 on Reader Service Card.

BANK AUTOMATION — *Important New Savings for Banks* has been published by Cummins-Chicago Corporation to introduce its low-cost Perf-O-Data processing equipment. The time-savers are classified Perf-O-Writers, Perf-O-Sorters and Perf-O-Readers.

Circle No. 75 on Reader Service Card.

MICROFILM INDEXING and FILING TECHNIQUES are described in this booklet which points out economical and efficient uses of microfilm in building an indexing and filing system. Charles Bruning Co., Inc.

Circle No. 76 on Reader Service Card.

FLOW CHARTING KIT offered free by Tab Products Co. consists of a folder containing pressure sensitive stickers of standard flow chart symbols and instructions next to the charting area. No messy revisions occur as the stickers may be moved at will and the final chart is readily reproducible.

Circle No. 77 on Reader Service Card.

"MODERN MAILING through Mechanization" is the title of a new brochure from the Bell & Howell Phillipsburg Co. which details the operation of the Phillipsburg inserting and mailing machine.

Circle No. 78 on Reader Service Card.

MAGNETIC TAPE RECORDER/REPRODUCER, the Ampex FR-100B, is described in a 20-page booklet which gives performance figures, accessories and examples of use.

Circle No. 79 on Reader Service Card.

MICR — Magnetic Ink Character Recognition, used in automatic check handling, is explained in Autographic Business Forms, Inc. 16-page booklet.

Circle No. 80 on Reader Service Card.

MAGNETIC INK CHECK PRINTING preparation is made easier by a Autographic Business Forms, Inc. sketch sheet which shows the exact locations for positioning all the preprinted data usually included on printed checks. It illustrates how to convert present fractional designations of bank number and routing symbol into the eight-digit number required under the ABA program. Printed on transparent paper, the sketch sheet may be used to overlay checks to determine quickly what areas at the bottom of the check need to be cleared to make room for magnetic ink printing.

Circle No. 81 on Reader Service Card.

"AUTOMATION LABELATION" is a case history brochure and kit which details various uses of the Allen Hollander Co. labels in different industries.

Circle No. 82 on Reader Service Card.

ARGUS ASSEMBLY LANGUAGE, the automatic routine generating and updating system for the Honeywell 800, is explained in a new manual presented by DATAmatic

Division of Minneapolis-Honeywell. Argus reduces the time and effort required to code and check out programs by allowing the computer itself to perform the routine clerical operations.

Circle No. 83 on Reader Service Card.

PAPER TAPE — A single-page data sheet describing three paper tape accessories for the Bendix G-15 digital computer is available. Included are PR-1 Auxiliary Photoelectric Paper Tape Reader, PR-2 Multi-code High-Speed Tape Reader and PTP-1 Auxiliary Paper Tape Punch. These units add greater versatility and expandability to the G-15.

Circle No. 84 on Reader Service Card.

LANGUAGE TRANSLATOR — A 16-page application information manual on the Model ZA-100 Computer Language Translator describes its data translation capabilities, the basic translation system, common translation modes, and other basic information. An illustrated appendix outlines the CLT systems now in operation in various parts of the U. S. The Translator is a data processing tool designed and developed solely by the Electronic Engineering Company of California.

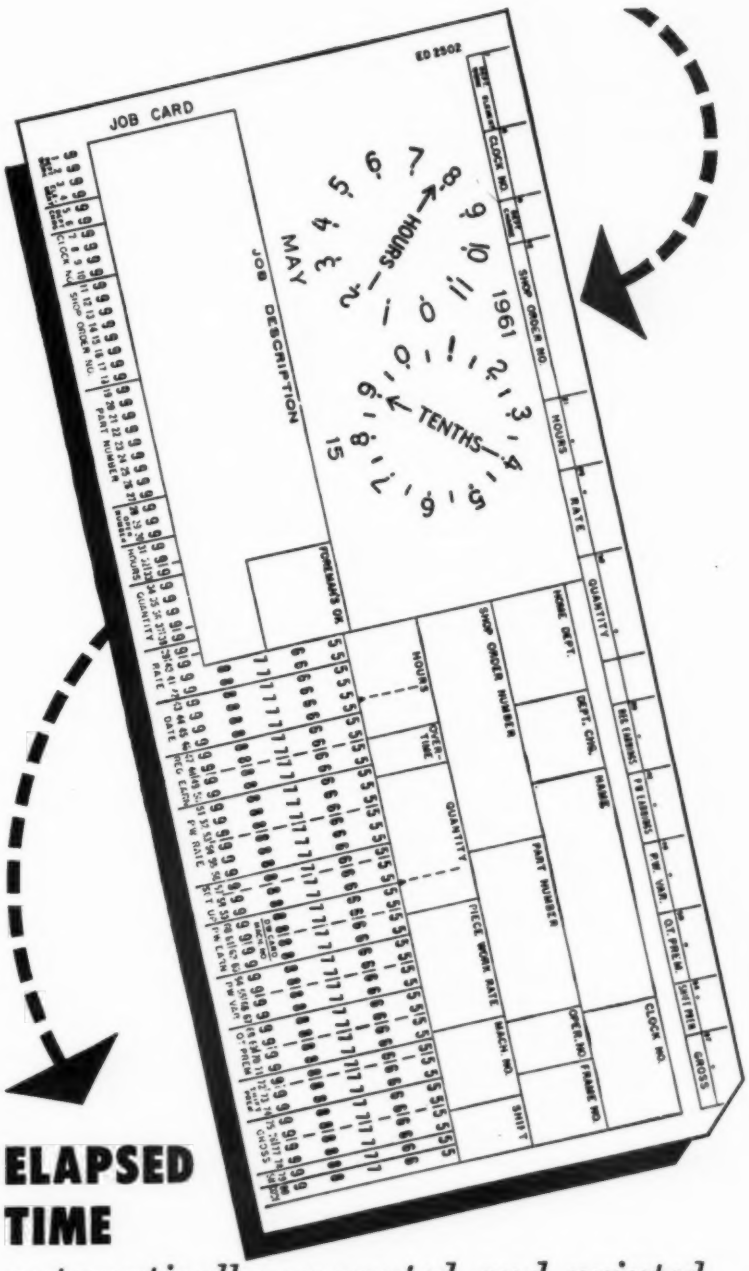
Circle No. 85 on Reader Service Card.

MEMORY BULLETIN, describing a series of general purpose high-speed memories, is available from Telemeter Magnetics, Inc. The memories, designated Type RB, are made in a wide range of sizes from 128 to 1024 words and from 4 to 24 bits per word. They operate at rates up to 125 kc and provide both random access and sequential types of operation.

Circle No. 86 on Reader Service Card.

MEMORY STACKS—Rese Engineering, Inc. of Philadelphia describes Series 3000 Apertured Ferrite Plate Memory Stacks, a line of miniature plug-in magnetic storage modules for use in high speed, coincident-current, random access memories and serial buffers. The two-page illustrated bulletin describes the ($2\frac{1}{2}$" x $3\frac{3}{8}$" x $3\frac{5}{8}$") plug in construction, the conventional coincident-current selection scheme, and the use of the 0.87 square apertured

(continued on next page)



ELAPSED TIME

automatically computed and printed on any job or tab card

If manual computation of elapsed time is time-consuming and error-producing, the automatic, foolproof Calculagraph can eliminate this weak link in your cost system. The time-tested Calculagraph, now available to industrial users, will do the job for you accurately, regardless of the card system you now use — it's that flexible. Write to us now and enclose samples of your job tickets.

Systems Dealers: Investigate opportunities in Selected Territories

INDUSTRIAL DIVISION

CALCULAGRAPH *Company*

Circle No. 19 on Reader Service Card.

315 Sussex Street, Harrison, N. J.

ferrite plates as the storage medium for the Memory Stacks, which range in capacity from 256 to 4096 words and 4 to 16 bits per word.

Circle No. 87 on Reader Service Card.

KEYSORT—The style sheet illustrates step-by-step Royal McBee Keysort Punching-Processing and Reading-Processing operations. Machine features outlined are: simple operation from 10-key keyboard; printed tape for immediate visual verification; non-add, sub-total and repeat keys. Card coding capacity is 10 digits in each of eight fields.

Circle No. 88 on Reader Service Card.

MOVABLE PARTITIONS — An eight-page full color reference guide to movable partitions, from rail high to ceiling height, has been published by Workwall Division of L. A. Darling Co. Four pastel color and four modern wood-grain surface finishes are listed as standard. Workwall's "workable wall" feature is also detailed, together with a partial listing of attachments and fixtures, including desks, tables, and credenzas, specifically designed for mounting with a screwdriver.

Circle No. 89 on Reader Service Card.

FLEXI-MATIC — A manual describing the use and operation of the Univac II Flexi-Matic library routine known as Trawl, has been published by Remington Rand. Trawl is an interpolative routine capable of producing a wide variety of the input-output subroutines required in a program. Designed for data processing runs, the subroutines produced will follow Univac II programming conventions. Trawl can provide rerun and a zero block if these are specified.

Circle No. 90 on Reader Service Card.

DATAFILE — Two brochures highlighting the features of the Burroughs 205 and 220 Datafile magnetic tape storage units are available. One describes the 220, a multiple tape unit with a capacity of 50-million digits; the other outlines features of the 205, describing some typical applications and giving a list of users. Datafile is one of two types of auxiliary magnetic tape storage used with the Burroughs 205 and 220 electronic data processing systems.

Circle No. 91 on Reader Service Card. ■

BOOK SHELF

SYSTEMS AND PROCEDURES — A Handbook for Business and Industry. Edited by Victor Lazarro with 19 contributing experts, Prentice Hall, Inc., Englewood Cliffs, N. J., 1960, 464 pages, $10.00.

This book discusses the review, analysis, and improvement of procedures in terms of money saved, improved employee morale and customer satisfaction. The four major areas of this study are: concept of the department, organizing and administering the department, program and project planning—each written to guide in planning the organization or reorganization of a Systems and Procedures Department. It covers in great detail the systems study, systems charting, the management audit, work simplification, work measurement, forms design and control, records management, company manuals, tabulating equipment in business, electronics in business, work sampling in the office, management research, and selecting and training systems men.

AUTOMATION AIDS EDUCATION (State of Iowa— Department of Public Instruction) by P. F. Johnson, M. M. Opiala and R. Van Dusseldorp, 1959, 144 pages.

This volume, intended primarily for use within the data processing department of the Iowa State Government, is assembled in such a fashion that it easily can be used as a basic reference work in a data processing course. The examples used are concerned with the actual processing of work by the State of Iowa. As the authors aptly point out, it can help other state governments understand and evaluate data processing methods and equipment. This is especially helpful to those states that do not as yet use automatic data processing techniques. The volume winds up with a look at current and future types of equipment and the necessity to keep informed in the field.

ELEMENTARY ANALYSIS — A MODERN APPROACH by H. C. Trimble and F. W. Lott, Jr., Prentice Hall, Inc., Englewood Cliffs, N. J., 1960, 621 pages.

The book is primarily a basic introduction into mathematics as used in analysis. Due to the ever increasing use of data processing equipment for analysis in the office, it will serve as a source reference for data processing personnel. The authors have used the outline and information from a course taught to college freshmen as an introduction to calculus and higher mathematics. Undoubtedly, the questions of their students plus the authors' abilities in mathematics have combined to assemble this excellent self-instructing and reference text.

WORK SIMPLIFICATION — CREATIVE THINKING ABOUT WORK PROBLEMS by Robert N. Lehrer, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1957, 394 pages.

The author, a professor and consultant of industrial engineering, has both the theoretical and practical know-how to present his material. Mr. Lehrer covers every phase of work simplification in both the office and the factory. He explains the methods and why they were developed. He also goes to great lengths to explain the need to keep cognizant of personnel in any work simplification program. There is adequate treatment of automation techniques in the office which are of particular interest to data processing personnel. If nothing else, the book gives guides to creative thinking about work simplification and why problems exist in that area.

■ ■ ■

INDEX TO ADVERTISERS

Baltimore Business Forms Co., The	41
Beemak Plastics	3
W. H. Brady Co.	21
Burroughs Corporation, ElectroData Div.	10 and 11
Business Electronics Inc.	51
Calculagraph Company, Industrial Div.	49
Codo Manufacturing Co.	3
Dresser Products, Inc.	51
Forms Inc.	6
Graphic Controls Corporation	37
Allen Hollander Co., Inc.	51
International Business Machines Corp., Data Processing Division	4 and 5
International Business Machines Corp., Supplies Division	29
Mac Panel Company	Third Cover
Moore Business Forms, Inc.	8
Ray Myers Corporation	30 and 31
National Cash Register Company, The	16
Pro-Forms Company	45
Radio Corporation of America	7
Ramsey Company	42
Scriptomatic, Inc.	12
System Development Corporation	Second Cover
Tab Products Co.	Back Cover
Wright Line, Inc., The	35

HOME STUDY COURSES

PROGRAMMING for BUSINESS COMPUTERS

Now Available

Training on the job or at home. Inform yourself and your staff with a study course for people without technical training or experience. No advanced mathematics required.

Practical workshop courses taught by computers experts who . . .

- Are actively programming computers.
- Instruct a similar university course.
- Understand business applications.

Proven in 3 years of business use.

Write for Free Brochures:

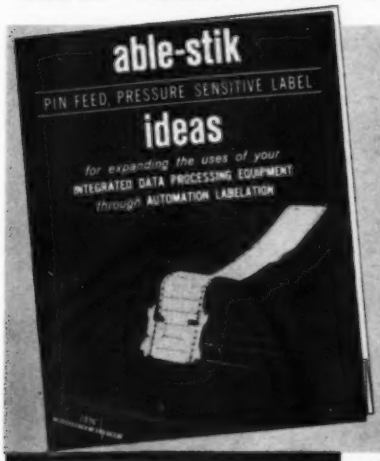
BUSINESS ELECTRONICS INC.
PROGRAMMING SECTION
420 MARKET STREET
SAN FRANCISCO, CALIF.

Circle No. 21 on Reader Service Card.

Member National Home Study Council

Circle No. 20 on Reader Service Card.

SEND TODAY FOR THIS FREE PORTFOLIO



Learn how self-sticking, non-moistening Able-Stik Pin-Feed labels open new horizons for Data Processing Equipment. Valuable ideas in this portfolio will show you how to get increased versatility, greater efficiency and more economy from your IDP machines. Send for your copy today.

allen hollander Company, Inc.
385 Gerard Ave., N. Y. 51, N. Y.

Share your ideas for making IDP machines more versatile and

WIN

a valuable prize for each idea used. Send for Able-Stik Automation Labelation portfolio and Contest Entry Blank.

Allen Hollander Company, Inc.—Dept. DP3
385 Gerard Avenue, New York 51, New York
Gentlemen:
Please send me your free Portfolio of Data Processing label ideas, along with contest entry blank.

Name_____
Title_____
Company_____
Address_____
City_____ Zone_____ State_____

THE *tapefile* LINE OF PUNCHED TAPE ACCESSORIES

- saves hours of filing and handling time.
- pays for itself time and time again.

#1157 MANUAL TAPE FOLDER folds up to 100' tapes rapidly for filing. Folding arm arced to fold tapes safely, remove easily.

ROTARY MASTER TAPE FILE
Holds up to 8,000 tapes on your desk, at your finger-tips. Lightweight, portable. Floor model holds up to 20,000 tapes. Ball-bearing turn-tables.

DATA PROCESSING FOLDERS
Save valuable time in processing and storing tapes, punched cards, and written documents. Slash front folders with tape or card pockets. Standard or legal size. Manila or green.

SAMPLE PACKET Folders and File Envelopes $1

DRESSER PRODUCTS
BOX 2035
PROVIDENCE 5, R. I.

Circle No. 22 on Reader Service Card.

EDITORIAL

"GIANT BRAINS"— A MISNOMER

WHEN ELECTRONIC COMPUTERS were gaining acceptance and popularity about a decade ago, their marvelous intricacies of engineering and incomprehensible speed tremendously excited the lay, the academic and the technical public alike. It appeared to many that this equipment had the ability to think—hence the label "giant brains."

As time wore on, however, hard-headed businessmen took a long, cold look at the economic feasibility of the use of computers in business, and in some cases, what they saw was not overly impressive. Certainly, from an engineering standpoint the large scale computers were masterpieces, just as well-designed bridges are masterpieces. The giant brain which was reputedly capable of human thought was precisely as competent as a desk calculator—except for speed. It could add, subtract, multiply, divide and compare two numbers to determine which was higher or if they were equal; it could determine if a number was plus or minus. Based on these last two comparison capabilities, the term "decision making" was bandied about.

When public relations meets business sense, the latter doesn't always come out the winner. The public became confused about the basic tenet that it will always be an idea which produces a machine, and never a machine which produces an idea.

This misconception was perhaps understandable in the early stages. Now that we have advanced in business use of computers, it is sometimes disappointing to see and hear people falling back on this time-worn and by now, trite reference. It is a reference that falls on many ears, and at this point, our reaction is one of resentment—for two reasons. First, it seems to indicate that the listener has not been educated by the past ten years, and second, the comparison between man and machine seems unnatural — more and more so as the increasing technology of our civilization makes us sensitive to the need for humanistic values.

Many businessmen have discovered problems in gaining computer acceptance from their own clerical staffs, and this *"giant brain"* talk does more harm than good. We in the field are impressed, not with what machines can do for people, but with what people can accomplish with the help of machines. ■

—for free information

on items mentioned in this issue of DATA PROCESSING

Please send information and literature on items circled below.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

PLEASE PRINT ALL INFORMATION

NAME_____ TITLE_____

COMPANY_____

KIND OF BUSINESS_____ NUMBER OF OFFICE EMPLOYEES_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

READER SERVICE CARD

March Issue — Use before May 15

FIRST CLASS
PERMIT NO. 13600
DETROIT, MICH.

BUSINESS REPLY CARD
No postage stamp necessary if mailed in the United States

Postage will be paid by—

GILLE ASSOCIATES, INC.
956 MACCABEES BLDG.
DETROIT 2, MICHIGAN

Your MAC PANEL representative is waiting to show you new products . . . let him in!

MAC / PANEL Company

General Offices: High Point, North Carolina
West Coast Office and Warehouse: San Francisco, California

Circle No. 23 on Reader Service Card.

A COMPLETELY NEW RANGE OF **CARD FILES** THAT INCLUDES EVERY FEATURE YOU'VE EVER WANTED

for every filing purpose . . . on every budget level . . .
tailored to modern punched card operations . . .
24 models—including 20, 14 and 10-drawer—
all with choice of full or ¾ suspension.
Standard interchangeable drawer fits all 24 models.

TAB
PRODUCTS CO.

Call your representative or write us for
Catalog 10 at 995 Market St., San Francisco.

Circle No. 24 on Reader Service Card.